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Original Articles

SOME INTERESTING AUTOPSY FINDINGS IN EPILEPTICS.*

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When I assumed the duties of pathologist to the Craig Colony, a year ago, the task before me of studying the pathology of epilepsy seemed a hard one, promising but little fruit. That such a pessimistic feeling had justification will be seen from the following passage by an author of such repute as Gowers,[1] and whose name is so intimately associated with the subject of epilepsy:

> Of the histologic changes revealed by the microscope, most of those which are not common, apart from symptoms, are apparently of secondary origin, the result and not the cause of the convulsions; and the various changes that have been described and have been supposed to be related to the origin of the disease have probably no connection with it, and do not even deserve enumeration. No greater significance can be ascribed to the induration of the cornua ammonis (pes hippocampi) to which weight has been attached by Meynert. Nor is there at present much likelihood that our knowledge will be more definite. The changes in the nerve elements are probably of that molecular character which is revealed only by altered functions and deludes the most minute research.

With such a basis to start from, the prospect of throwing new light on the pathogenesis of epilepsy along the lines of pathologic anatomy and pathologic histology seemed very small indeed. Nevertheless, an expectant neutral attitude of unprejudiced observation seemed indicated and has brought forth some gratifying results, showing that the field of pathologic anatomic and pathologic histologic research is not altogether exhausted and that quite a little may be learned yet about epilepsy from investigation in this direction.

In a recent paper, Dr. M. Allen Starr[2] makes the statement that a careful review of many facts offered by recent advances of our knowledge of the nervous affections seems to him to demonstrate the fallacy of the prevailing opinion and to prove conclusively that epilepsy is usually, if not always, an organic disease.

Whether and to what extent Dr. Starr's statement is borne out by the facts to be presented below is left to the judgment of the reader. The said facts are the outcome of experiences gained in sixteen autopsy cases of "epilepsy," in thirteen of which the brain was examined.

It should be said here that it is more appropriate to speak of epilepsies than of epilepsy, since the variety of the forms of this disease, if we so choose to call it, is so great that they ought to be kept apart. Indeed, it is my conviction, expressed in a previous publication,[3] and supported by such an author as Féré, that we should rather consider epilepsy as a symptom than as a disease, which symptom may accompany pathologic processes of different nature and location.

If we put ourselves on this broad and neutral basis, then the anatomic findings here presented may find their due appreciation and, eventually, classification.

Before proceeding to the enumeration of the autopsy findings, a word should be said regarding the difficulties that assail us in attempting to obtain material for pathohistologic investigations.

In the first place, it is very often difficult to obtain an autopsy. This difficulty has been greatly diminished by the legislative efforts of Dr. William P. Spratling, which, pursued through several years, have finally borne fruit. The result of this effort is the passage of a law allowing, under certain restrictions, autopsies on all indigent cases dying at the colony, and affording thus a greater number of autopsies than it was possible to obtain before it was passed. While the restrictions above mentioned are still quite considerable, the passage of this law is a great step in advance, the breaking of ground for further gains in that direction. However, even under this law the autopsy has sometimes to be made as late as forty-eight hours after death, which would, under ordinary circumstances, entirely spoil the nervous system for histologic investigations. This impossibility of obtaining an early autopsy being of very frequent occurrence, means had to be found of preserving the central nervous system preliminarily as soon as possible after death, so as to make the material available for investigations even under such unpropitious circumstances. This was done by injecting into the dural sac a 12 per cent. solution of formalin by means of lumbar puncture and of puncture through the foramen magnum. This method, which I described in the *Medical Record*, July 9, 1904, proved very efficient, as shown by the fact that pieces from the cortex of the motor region, cerebellar cortex, caudate nucleus and the medulla of a brain preserved in such manner[4] reacted beautifully to the neuroglia stain. This, in view of the rapidity with which neuroglia otherwise undergoes postmortem decomposition, shows the value of the method.

The further advantage of the method is that it hardens at the same time and thus preserves the shape of the different structures. It shares this virtue with

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* Read in the Section on Nervous and Mental Diseases of the American Medical Association, at the Fifty-fifth Annual Session, June, 1904.

1. Gowers: A Manual of Diseases of the Nervous System, 2d Edition, Philadelphia, 1898, page 753.

2. M. Allen Starr: Is Epilepsy a Functional Disease? Jour. of Nerv. and Men. Dis., vol. xxxi, March, 1904.

3. B. Onuf: Some Features of the Epileptic Attack, Amer. Medicine, vol. vii, No. 5, p 183, Jan. 30, 1904.

4. The preliminary subdural formalin injection was made one hour after death, the autopsy 43 hours after death.

the method of Drs. A. Meyer and Dunlap practiced at the Pathological Institute of the New York State Hospitals, namely, hardening of the brain by means of injecting 10 per cent formalin solution into the ascending aorta, after tying off the thoracic aorta. While

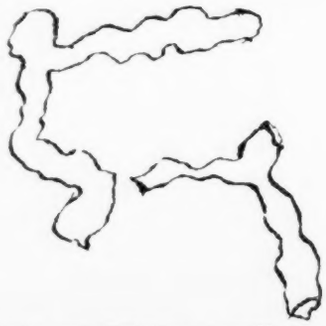

Fig. 1.—Tortuosity and dilatation of capillaries. Drawn from a specimen with camera lucida.

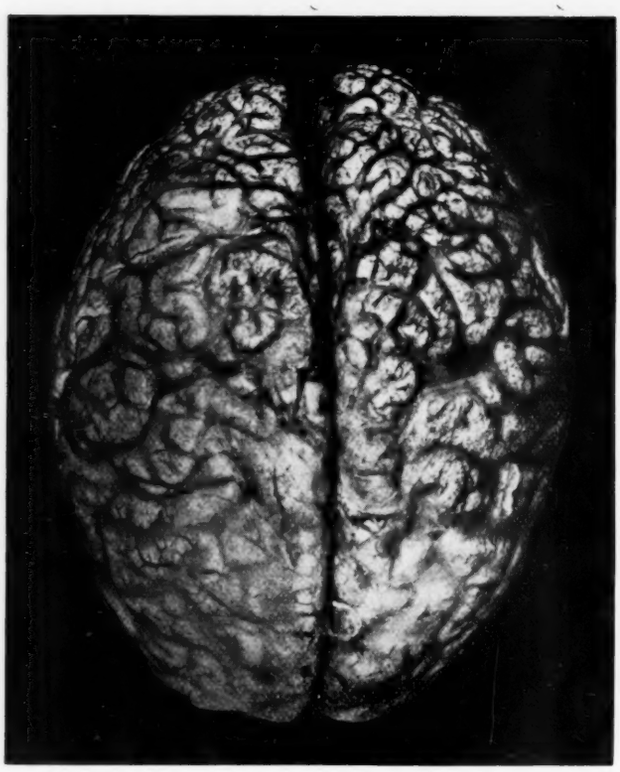

Fig. 2.—Case 13, showing thickening of the pia over the fronto-parietal lobes.

this latter method is to be preferred when an early autopsy can be made and when expense plays no rôle, the subdural injection requires much less formalin and is, therefore, more economical. Moreover, it leaves the body unmutilated.

I proceed now to the enumeration of certain changes found in the deceased epileptics on whom I performed the autopsy. The total number from June 1, 1903, until June 1, 1904, amounted to 16.

It is not intended here to enumerate all changes found, but only those which, by their frequency, aroused attention, namely, first, valvular changes of the heart; second, aneurismal dilatation and tortuosity of the capillaries, particularly those of the lungs and of the kidneys; third, acute pneumonia; and fourth, changes in the brain to be specified below.

For clearness sake, the changes found have been tabulated.

VALVULAR LESIONS.

The number of cases in which an autopsy of the heart was made was 15 (since in Case 17 only a brain autopsy had been permitted). Of these 15 were 12 who showed distinct changes of one valve or the other, or 80 per cent., while in the thirteenth case (20 per cent.), they were so slight that we excluded it from consideration.

The valve most frequently affected was the mitral, which, indeed, was involved in every case in which there was a valvular lesion at all; i. e., 12 times out of 15.

Next in frequency was the disease of the aortic valve; namely, in 5 cases, or 33 per cent., marked involvement, while in 3 cases (Cases 4, 13 and 16) it was of very slight extent or doubtful.

Less frequent was involvement of the tricuspid, which was distinctly diseased in 3 cases (20 per cent.) and slightly, if at all, in the fourth case (Case 13).

By excluding the cases in which the changes were

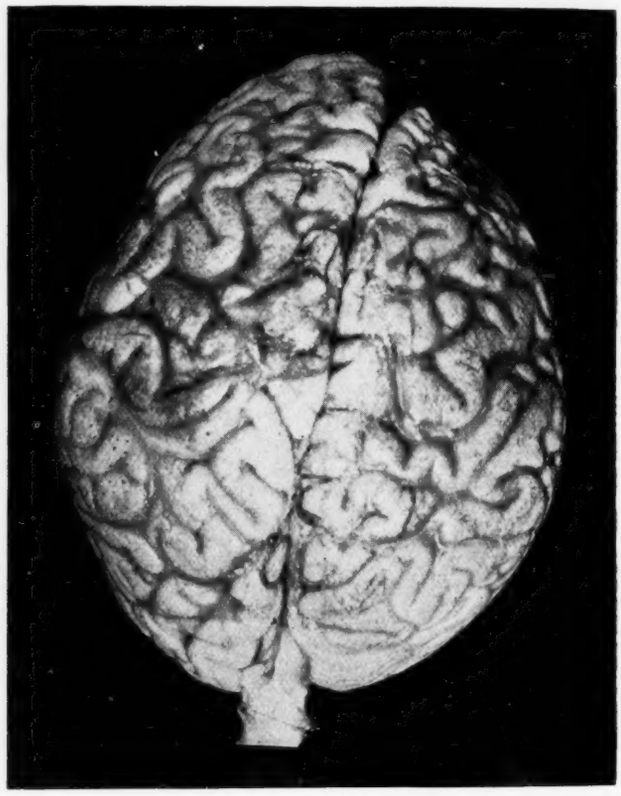

Fig. 3.—Case 12. Circumscribed atrophy of the right frontal lobe.

slight or doubtful, we find the respective valves affected in the following numerical proportions and combinations:

	Cases.	Per cent.
Mitral valve alone, diseased	6	40
Mitral valve plus aortic valve, diseased	3	20
Mitral valve plus tricuspid valve, diseased	1	6.6
Mitral valve plus tricuspid plus aortic, diseased	2	13.3
Total	12	79.9

As to the nature of the change, Case 22 ought to first be thrown out as presenting changes of a different character than the rest. In this case the mitral valve showed a wart-like granulation of soft consistency. In all other cases the changes consisted chiefly in a shortening of the valve and a thickening and hardening of its margin. The appearance was most like that of atheroma. No erosions nor calcareous deposits were present on the surface of the valve.

As to the rôle that age might play in the production of these changes, a look at the table shows that only in

a small percentage senility could be considered the cause, even if liberal allowance were made in this regard. In Case 15, the age was 94; in Case 9, it was 61; in Case 10, it was 50; in Case 6, it was 42, and in Case 21, it was 35. In these last two cases, senility can really not be considered, and all others were considerably beneath 35, so that senility can not account for the majority of the cases. Another issue to be discussed was whether the presence of these valvular changes stands in any relationship to the severity and number of attacks of the respective patients. For the suggestion of investigating this particular point, I am indebted to a discussion at a conference at Buffalo of the Physicians of the Western State Hospitals of New York, held in May, 1904. Before this conference I read a paper on the same subject, and this suggestion was called forth when I brought up the question whether the valvular changes reported were

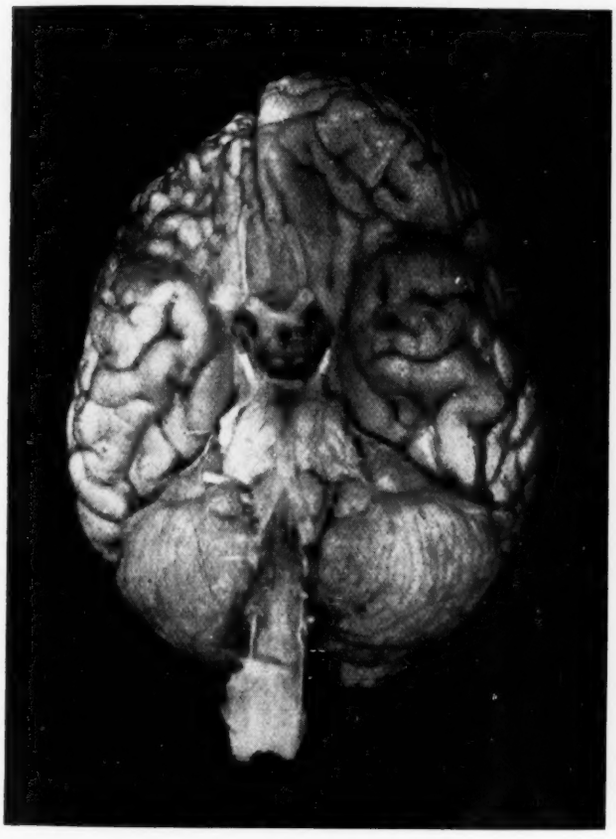

Fig. 4.—Case 12. Circumscribed atrophy of the right frontal lobe.

to be considered as primary or as secondary; i. e., produced by the severe strain accompanying severe seizures. In following up this idea, I tried to calculate, so far as possible, the total number of grand mal and petit mal attacks during the life of each patient. That such a calculation can only be approximate is evident. In making it, chief reliance had to be placed on the observations made at the colony, since here each attack, so far as feasible, was recorded. The table gives the result of this attempt, and, on the whole, it does show an unusually large number of severe attacks; i. e., grand mal attacks. In only one case (Case 15) the total number of grand mal attacks was too small to count as an etiologic factor and, in this case, the age of the patient (94 years) warrants us in considering the changes as senile atheromatous ones. (Case 22, as will be remembered, was excluded, as there the changes were of a totally different character.)

Barring this case, evidence is, therefore, considerably in favor of looking on the valvular changes as secondary and as brought about by the strain to which the circulatory system is put in a grand mal seizure.

Histologic investigations of these valvular changes have not sufficiently advanced to permit a report of the findings.

PATHOLOGIC CHANGES OF THE CAPILLARIES.

In several of the autopsy cases, the capillaries of certain organs, particularly of the lungs and kidneys (at least, I have investigated these chiefly) presented striking changes; striking not only by their intensity, but also in their extent, since the majority of the capillaries in these organs were thus involved. The changes consisted in tortuosity of the capillaries and of aneurismal dilation of the same, such as is illustrated in Figure 1.

Fig. 5.—Case 17. Hydrocephalus. Left lateral view. Ventricles empty.

In all the cases so far examined in which these capillary alterations were found, valvular changes were also present, and I was first inclined to consider them as secondary to these. It now seems more probable, however, that they are both due to the same cause; i. e., the tension of the circulatory system in severe seizures.

ACUTE PNEUMONIA.

How frequent a chief or contributory cause of death acute pneumonia was, is evident from the table, which shows the presence of this disease in eight of the fourteen autopsy cases in which the lungs were subject to examination; i. e., in 58 per cent. One of these was an aspiration pneumonia; the others were all lobar pneumonias, with perhaps one exception.

In some of the cases the microscopic diagnosis of pneumonia was supplemented by histologic investigation which confirmed it in each case.

CEREBRAL CHANGES.

Of the sixteen consecutive cases in which I have performed the autopsy, one was unavailable for investigation of the brain, as the brain autopsy was not allowed. In the second it was omitted for some other reason, and in the third the brain was lost. Abstraction of these three leaves thirteen cases in which the brain was examined.

Whenever it seemed desirable, a Meynert section was made; i. e., the pallium was detached from the cerebral axis.[5] In four cases, however (Cases 12, 14, 17, and 22), this was omitted, so as not to spoil the brain for definite lines of investigation.

This leaves nine cases in which the cerebral axis was examined.

On looking over the table, one is struck with the fact that not one case was free from some distinct organic change of the brain itself, exclusive of meninges or blood vessels.

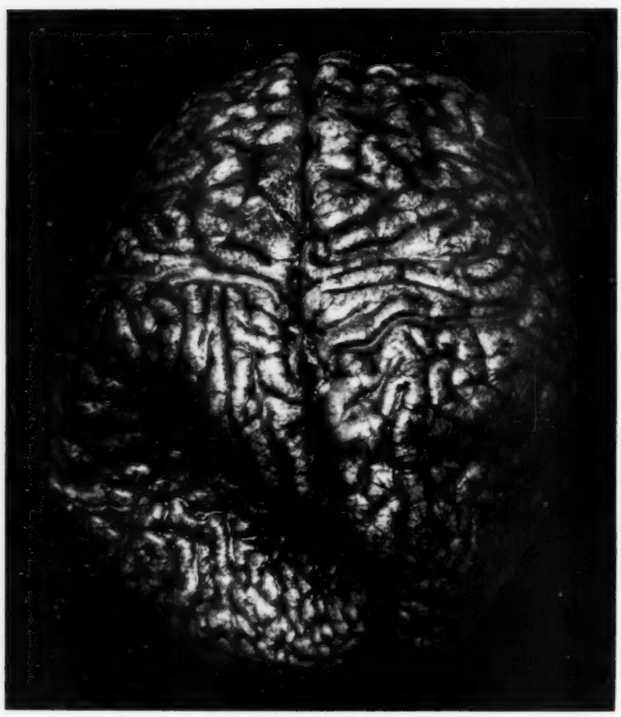

Fig. 6.—Case 17. Upper view. Ventricles empty.

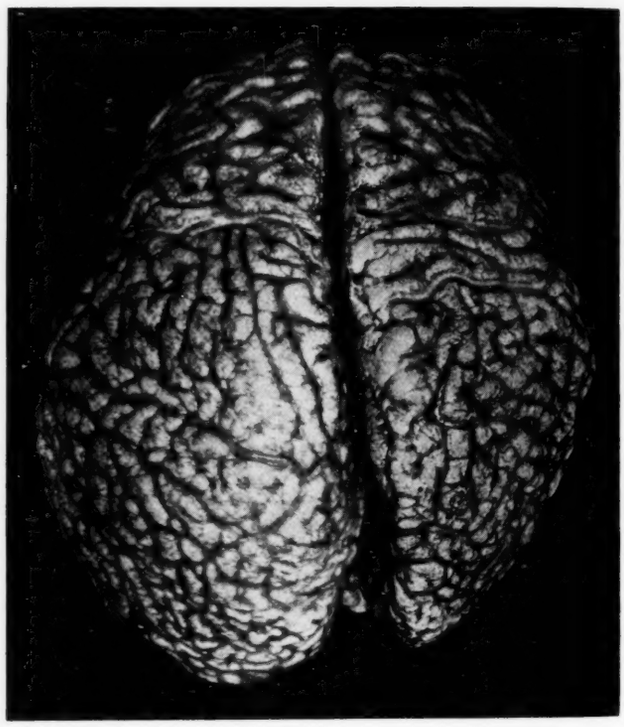

Fig. 7.—Case 17. Upper view. Ventricles filled.

I shall first discuss the lesions of the hemispheres found, then those of the cerebral axis and of the cerebellum.

GROSS LESIONS OF THE CEREBRAL HEMISPHERES.

One feature common to at least ten cases was a very marked thickening of the pia over the hemispheres, chiefly over the convexity of the fronto-parietal lobe. In some of these cases it was, in some regions, as thick as a normal dura. In all of the cases but one (Case 19), there was at the same time a more or less marked shrinkage of the convolutions beneath the thickened pia, affecting on the convexity the frontal lobe, the central convolutions and the upper parietal lobule, sometimes also the lower parietal lobule.

This thickening of the pia is well illustrated in Figure 2 (Case 13).

It is of interest to know that the convolutions of the base of the brain and those of the occipital and temporal lobes, with the exception of the vicinity of the sylvian fissures, were in most of these cases free from gross atrophic changes.

Gross Vascular Lesions.—Distinct gross vascular lesions affecting the circle of Willis and its branches were present in five cases (Cases 9, 14, 19, 20, and 22). The arteries in these cases showed tortuosity, irregularities in caliber, and thickening and stiffening of the walls, some features being more marked in one case, and others in another. Beside these diffuse changes, some cases presented marked focal changes, namely:

Circumscribed Atrophy of the Right Frontal Lobe (affecting its entire base and the anterior half of its convexity).—This was found in one case (Case 12), and is illustrated in Figures 3 and 4. Unfortunately, the history was inadequate to account for the lesion.

Subdural Hemorrhage Over the Posterior Part of the Second and Third Frontal Convolutions and Lower Part of the Central Convolutions.—In this case, the epileptic seizures were of a Jacksonian character, with preservation of consciousness during the entire attack. Strange enough, however, the muscles involved in the seizures were the arm and neck on the left side, while the lesion was found over the left hemisphere, and none over the right. A few days before death, the patient developed thick speech, marked aphasic disturbance, slight difficulty of swallowing, and some symptoms pointing to slight laryngeal involvement. The diagnosis was accordingly made of a lesion at the lower end of the central convolutions. This diagnosis was to a great extent confirmed by the autopsy; only, instead of a hemorrhage, a syphilitic lesion, in the nature either of a circumscribed meningitis or a gumma, had been expected, there being the history of a chancre antedating the onset of the epilepsy by about one year.

Internal Hydrocephalus.—This was found in one case. This may be classed among the focal cases, as it affected almost entirely the temporal, parietal and oc-

5. The cerebral axis consists of the basal ganglia, plus island of Reil, corpora quadrigemina, pons and medulla.

cipital lobes, to the complete or almost complete exclusion of the frontal lobe. The left hemisphere was much more affected than the right.

A feature of interest in this case was the smallness and great number of convolutions of the parietal, occipital and temporal lobes, which were of a vermiform type, while those of the frontal lobe were of about normal size and type. This abnormality of gyration suggests a congenital origin of the hydrocephalus. This finds also some confirmation in the history, which says that "labor was prolonged" and the child delivered by forceps. The mother had a severe fright while pregnant. For illustration see Figures 5 to 8, showing the hydrocephalic brain in different aspects, with the ventricles filled and with the ventricles emptied.

GROSS LESIONS OF THE CEREBRAL AXIS AND CEREBELLUM.

Cerebellar Cyst.—The cerebellum showed a marked

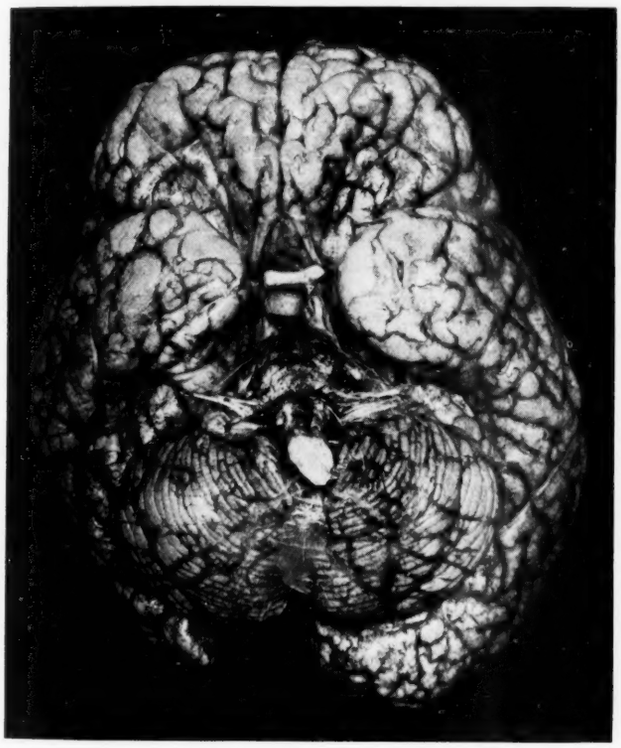

Fig. 8.—Case 17. Basal view. Ventricles filled.

focal lesion in one case, namely, cyst of the upper vermis and of the adjoining part of the cerebellar hemisphere (Case 20). This cyst was about the size of a crabapple and had caused a slight atrophy of the entire cerebellar hemisphere in which it was located. The contralateral olivary body was markedly atrophic.

The cyst was almost directly beneath the surface, being covered mostly by thickened pia. Nothing was left of cerebellar tissue as a covering except a few narrow, thin bridges, passing in transverse directions (Fig. 6, Case 22).

Here the method of preliminary subdural formalin injection proved extremely valuable, as the appearance of the focus would have been greatly changed without it. The autopsy in this case was made 58 hours after death.

Shrinkage of Cerebellar Convolutions.—Another interesting cerebellar change was found in three cases, namely, shrinkage of the convolutions of the upper vermis and of the cortex of the adjacent parts of the cerebellar hemispheres (Case 16, Fig. 10; Case 18, Fig. 14; Case 21, Fig. 17). This was particularly striking in Case 16.

Cerebral Axis.—Here the most interesting changes were found in the thalami and geniculate bodies. The cerebral axis was examined in nine cases, and in seven of these nine cases distinct changes were present in one or both thalami (Figs. 9 to 17).

It must be emphasized that the nine cases in which the Meynert section was performed and in which consequently the cerebral axis could be inspected were not picked out from among the rest. The reason why, in the remaining four cases in which the brain autopsy was made, the Meynert section was not performed, was that doing so would have spoiled them for definite lines of investigation.

The changes in the thalamus and geniculate bodies were in the nature of an atrophy. In some cases the surface had a decidedly shriveled appearance—see, for instance, photographs of Cases 6, Fig. 11 (left side) and 21, Fig. 17 (both sides). A difference in the size

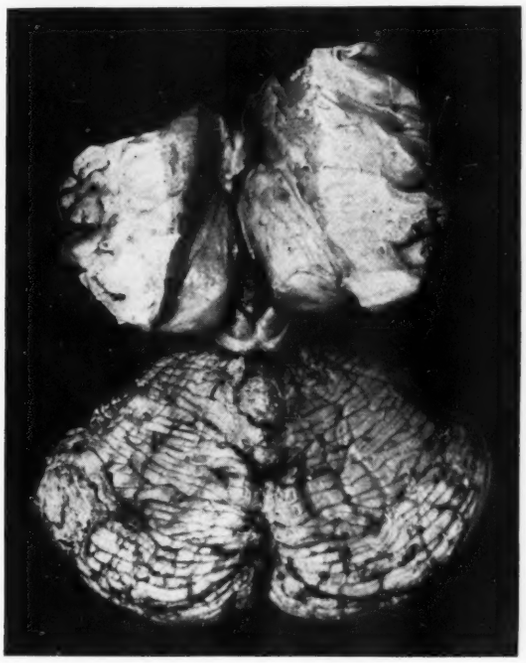

Fig. 9.—Case 9. Left thalamus smaller than right and marked attenuation of pulvinar thalami on both sides.

of the two thalami was noted in Cases 6 (Fig. 11), 9 (Fig. 9), 16 (Fig. 10), and 18 (Fig. 14), in which the left thalamus was smaller than the right one, and in Case 13 (Fig. 13), in which the right thalamus was smaller than the left. Whether in Cases 19 (Fig. 15) and 20 (Fig. 16) the right thalamus was also slightly smaller could not be definitely made out, although it seemed so.

Sometimes the change affected more the pulvinar, sometimes more the other parts of the thalamus.

The pulvinar changes were in some cases extremely marked, the pulvinar being thinned out to a ledge-like wedge instead of forming a well-rounded prominence. This is particularly well illustrated in Cases 9 (Fig. 9) and 13 (Fig. 13) on both sides, and in Case 21 (Fig. 17) on the left side.

The anterior tubercle of the thalamus was likewise extremely reduced in size in some cases (symmetrically or asymmetrically), as a look at the pictures of the nine

cerebral axes easily shows. In Case 21 (Fig. 17) it was detached to some extent from the remainder of the thalamus, and in Case 20 (Fig. 16) this separation was still more marked, giving the two anterior tubercles an almost pedunculated appearance. It is true that this latter case was the one containing the cerebellar cyst.

The external geniculate body seemed much attenuated and the internal geniculate body unusually small in a number of cases. However, in this respect I would reserve judgment until further investigation.

The details as to which part was affected in each particular case are also recorded in the table.

A point worthy of note is, further, the disproportion between the size of the corpora quadrigemina on one side and the thalamus on the other. A look at the figures of the different cases shows the differences of the proportion between these two structures. For illustration, two extreme cases may be picked out. In Case 18 (Fig. 14), for instance, the mass of the four corpora quadrigemina is almost the size of the left thalamus. In Case 19 (Fig. 15), on the contrary, this mass is only about one-quarter of the size of the left thalamus. The

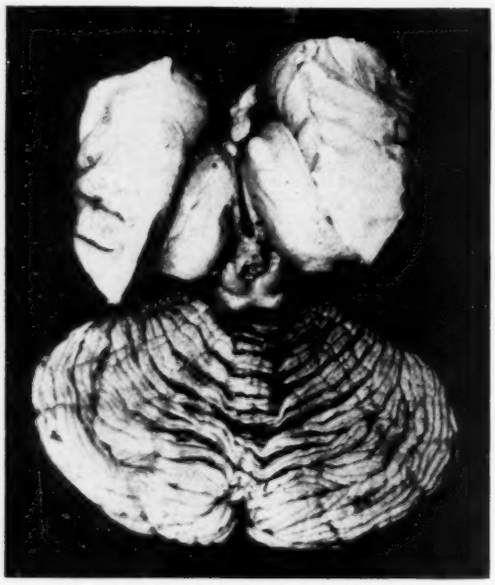

Fig. 10.—Case 16. Left thalamus smaller than right. Note also the difference in size of anterior tubercles of the thalamus. Marked shrinkage of convolutions of the superior vermis cerebelli and adjoining parts of the cerebellar hemispheres.

pineal gland here masks the picture somewhat, but leaves, nevertheless, no doubt as to the discrepancy, in this regard, of the two cases mentioned.

It is very probable that in these cases it is the size of the thalami and not that of the corpora quadrigemina that is at fault, nevertheless a reduction in size also of the corpora quadrigemina cannot be quite excluded *a priori*.

The great frequency and intensity of the changes found in the thalamus and cerebellum call for special discussion of their possible significance, particularly that of the thalamic changes.

EPICRISIS OF THE THALAMIC CHANGES.

A question that first suggests itself in relation to the observed findings in the thalamus is whether such do not represent perfectly normal conditions, *i. e.*, whether it is not perfectly common and normal to find such differences in size between the two thalami or between parts thereof, as have been here reported. This question it is safe enough to answer in the negative, since, if such marked asymmetries and proportional differences were common, they could not have escaped observation by many authors and would therefore be well known.

Moreover, the shriveled appearance of the surface of the thalami observed in some cases, as also the wedge-like attenuation of the pulvinar seen in a number of the cases, suggest a process of shrinkage rather than a congenital difference of proportion; *i. e.*, an unequal development. So much can be said previous to histologic investigation.

The changes being acquired ones, the other question to consider is whether they are simply accidental accompaniments, or whether, on the contrary, they have some bearing on the epilepsy, direct or indirect. The conception that they are accidental can hardly be maintained, in view of their great frequency. But, on the other hand, if we assume a relation between these thalamic changes and the epilepsy, three possibilities must again be weighed against each other:

1. The alterations in the thalami might form part of some general process and yet not have anything to do with the causation of the epilepsy itself. To give an illustration: The thalamic pathologic process might

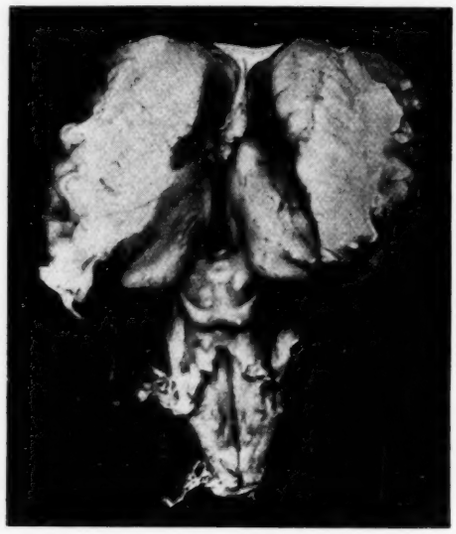

Fig. 11.—Case 6. Also left thalamus smaller than right and difference in size of anterior tubercles of thalamus.

be part of a process affecting the brain *in toto*; i. e., diffusely; but only that part of this diffuse process involving the cerebral cortex would have anything to do with the causation of the epilepsy. If this were so, such processes would certainly deserve to be known.

2. The thalamic lesion might be entirely secondary, the result of multiple seizures; whether such result is in the nature of inflammatory processes, or of circulatory disturbances, or of toxic changes produced by each attack.

3. The third possibility is that of a direct bearing of the pathologic process of the thalami to that of the epilepsy. As we have grown used to consider epilepsy as a cortical disease, the conception that the thalamus may have something to do with it seems like a step backward; i. e., a relinquishment of ground gained; yet the recent advances in our knowledge of the anatomic connections of the thalamus make it appear possible to ascribe to the thalamus some rôle in the provocation of epileptic seizures without denying the instrumentality of the cortex in their production.

H. H. Hoppe[6] in discussing the anatomic connection and physiology of the thalamus makes the following statement:

It has been established as an anatomic fact, by the researches of Dejerine, Long, Probst, von Monakow, Koelliker, Bechterew, Flechsig, Schäfer and Spiller, that, first, the thalamus is connected by fibers with a large section of the cortex, and reversely that the cortex is connected with the thalamus opticus; and that, second, all the centripetal sensory tracts end in the thalamus.

Hoppe, furthermore, quotes Monakow as having the view that the optic thalamus is an important link in the central apparatus for the perception of impressions made on the special senses and the skin, more especially on the latter.

These facts lend considerable strength to the speculation that an excess of stimulation proceeding from the thalami to the cortex—as might occur in an irritative pathologic process of the thalami—would lead to an overcharge of the elements of the latter, which would

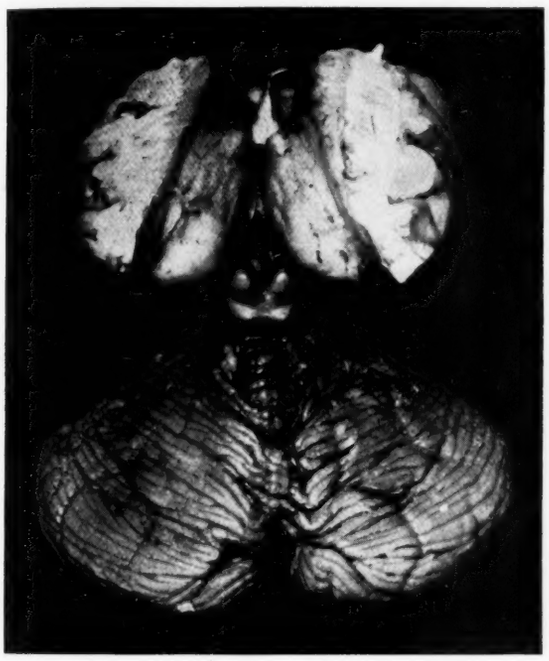

Fig. 12.—Case 5. Thalamus and geniculate bodies apparently free from changes.

from time to time be relieved by an explosive discharge of the accumulated surplus of nerve energy.

While this theory for the present must remain a speculation, it is strengthened by the result of physiologic experiments made by Ziehen.[7] This author first refers to former experiments, in which he states to have proved that in the dog the clonic part of a convulsion as brought about by faradic cortical excitation was of cortical origin, its tonic part and the running movements, however, of infracortical origin. He then proceeds to a description of his last experiments, the chief results of which concerning us here were as follows:

Superficial mechanical and weak faradic excitation of the thalamus was without effect. Strong faradic excitation owing to coexcitation of the internal capsule causes tonic contractions (of face, forelegs and hindlegs). Severance of the thalamus (by cutting) in the anterior level causes only a momentary startling movement (*Zusammenfahren*); severance in the posterior levels leads to a mild upheaval (*Aufsturmen*) of the animal and an excessive running movement, the latter being occasionally followed, after a short pause, by a tonic convulsion, due, probably, to secondary excitation of further removed parts.

Mechanical or faradic excitation in the domain of the anterior corpora bigemina (as well as the external geniculate body) produces the same morbid running movements, but in markedly exaggerated degree, often accompanied by cries (Schreien). They outlast the excitation by several minutes. Frequently a tonic convulsion follows.

Mechanic and faradic excitation as well as severance (by cutting) in the domain of the posterior corpora bigemina give rise to an extreme tetanic convulsion outlasting the excitation by a long period.

Ziehen concludes from these experiments that in the region of the optic thalami and of the corpora quadrigemina must be situated centers for higher co-ordinated movements. In the above experiments they were probably not excited directly, but reflexly. He deems it probable that the intracerebral pathway of the optic nerve might play a conspicuous part in this. Also the convulsion produced from the posterior corpora bigemina is probably in the nature of a reflex.

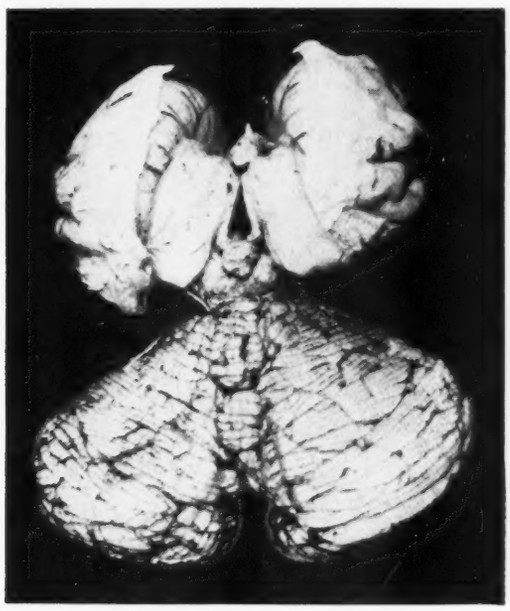

Fig. 13.—Case 13. Right thalamus smaller than left, and marked attenuation of pulvinar thalami on both sides.

No matter what importance we lend to these experiments of Ziehen—and it seems to me that they deserve some attention—the thalamic changes found in such number in the brains of deceased epileptics at the Craig colony demand an explanation. They show that it is one-sided to exclusively investigate the cortex or association tracts and no other structures of the brains of epileptics. It is but fair to admit that the majority of cases forming the basis of this report were advanced ones with marked mental deterioration. Nevertheless, they may also be found in more recent cases; at any rate, such should be investigated in this regard.

Which of the three possibilities of interpreting the thalamic changes will prove to be the correct one, or whether a combination of one with the other will prove

6. H. H. Hoppe: A Clinical and Pathological Contribution to the Study of the Central Localization of the Sensory Tract, Jour. of Nerv. and Men. Dis., vol. xxxi, May, 1904, p. 281.

7. Ziehen: Zur Physiologie der subcorticalen Ganglien und über ihre Beziehungen sum epileptischen Anfall. XIII. Wanderversammlung der südwestdeutschen Neurologen und Irrenärzte Arch. f. Psychiatrie, vol. xx, 1889, p. 584.

the right solution, must remain a subject for further research and thought.

It is of some interest to quote here what Dr. Spratling[8] says relating to Tuke's classification of epilepsies. Tuke speaks of "thalamic epilepsy," and defines it as "a form of epilepsy supposed to be due to a lesion in the optic thalamus. Special sense auræ are supposed to oftenest occupy this form."

CLINICAL DEDUCTIONS AND REMARKS.

Some important clinical deductions are to be drawn from the facts presented in this paper. The changes in the pulvinar and apparently also in the external geniculate body were so marked in some cases that the ophthalmoscope in all probability would have revealed an atrophy of the disc. The importance of examining the fundus in all cases becomes thus evident.

Fig. 14.—Case 18. Left thalamus smaller than right.

Fig. 15.—Case 19. Right thalamus smaller than left.

Likewise, the smallness of the internal geniculate bodies points to an involvement of hearing which also ought to be given clinical consideration. It is to be regretted that in the cases reported by me these points had not been inquired into clinically. I am responsible only for the anatomic investigation, with the exception of Case 22, which I had the opportunity of examining clinically.

It was first intended to append the clinical histories of the cases, but as these were inadequate, especially in their neurologic aspects, they have been omitted.

It should be said, however, that there was no doubt about all the cases reported being epileptics.

How important a thorough clinical investigation is for the understanding of these cases is shown by the various anatomic findings in those cases I reported, which must have had some clinical equivalents. It is only by a careful comparison of the clinical with the anatomic evidence that these cases can attain their full value. Certainly the routine method so much in vogue of simply taking what the German calls an "anamnesis," that is, the family and previous history of epileptics, without making a thorough medical, neurologic and psychic examination of these patients does not do these patients justice, and will not lead to any progress in the understanding of this disease.

Fig. 16.—Case 20. Cerebellar cyst on left side; also peculiarly shaped, almost pedunculated anterior tubercles of the thalamus. They are unusually small.

Fig. 17.—Case 21. Right thalamus smaller than left. Pulvinar thalami markedly attenuated on left side.

The cerebellar changes noted in three cases (shrinkage of the convulsions and adjoining part of the hemispheres in two, cerebellar cyst in one) deserve a brief

8. Tuke: Dictionary of Psychological Medicine, vol. 1, p. 449, quoted by William P. Spratling in Epilepsy and Its Treatment, Philadelphia, 1904, p. 26.

TABLE OF AUTOPSY FINDINGS IN 16 AUTOPSIES OF EPILEPTICS.

Laboratory No. of Case	No. 4	No. 5	No. 6	No. 9	No. 10	No. 12	No. 13	No. 14	No. 15	No. 16	No. 17	No. 18	No. 19	No. 20	No. 21	No. 22
Age at death (in years)	19	34	42	61	50	18	18	19	93	33	11	18	23	20	35	23
Age at onset of epilepsy (in years)	0	4?	0	44	20	8	11	1½	88 or 89.	1 or 3?	11/12	6½	14	2	21	21
Duration of epilepsy (in years)	19	30?	42	17	30	10	7	17½	4 or 5.	28 or 30	10	11½	9	18	14	2
Number of petit mal seizures. Average per annum before admission.	0?	?	0?	0?	6-12-200	?	?	Probably numerous.		?	?	?	?	?	?	?
Number of petit mal seizures. Average per annum at colony.	5	28	0?	95	14	3	9	49	1	43	1	36	5	18	12	1399
Number of petit mal seizures. Approximately ascertainable total during life.	.....	840	0?	1600	520	30	60	900	5	1200	10	400	45	300	150	3600
Number of grand mal seizures. Average per annum before admission.	70?	50?	100?	700?	3-4	100-150	1-365	12-52	12	52-365?	12-365-730	1-2-365	About 50	100-365	About 12	?
Number of grand mal seizures. Average per annum at colony.	50	31	21	27	4	131	250	179	1	264	?	98	60	128	45	55
Number of grand mal seizures. Approximately ascertainable total during life.	.....	1000	800	450	100	1200	1500	1500	25	6000	?	1000	500	2000	500	100 See note.
Valvular lesions. Mitral	1	.....	1	1	1	1	.....	1	1	1	Only brain autopsy allowed.	1	1	1?	1	11
Valvular lesions. Aortic	?	.....	1	1	.....	.....	?	.....	1	?		1	.....	.....	1	.....
Valvular lesions. Tricuspid	.....	.....	.....	.....	.....	.....	?	.....	1	1		1	.....	.....	.....	.....
Valvular lesions. Pulmonary	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....		.....	.....	.....	.....	.....
Pneumonia	.....	.....	1	1 Aspiration.	1	1	*	.....	.....	1		1	1	1	.....	.....

*Lungs not examined.

Laboratory No. of Case	No. 4	No. 5	No. 6	No. 9	No. 10	No. 12	No. 13	No. 14	No. 15	No. 16	No. 17	No. 18	No. 19	No. 20	No. 21	No. 22
BRAIN. Gross lesions of cerebral hemispheres. Marked thickening of pia over hemispheres, chiefly over convexity of fronto-parietal lobe	Brain has been lost	1	1	1	No brain autopsy made	?	1	1	No brain autopsy made	See note No. 1.	.....	1	1	1	1	1
Gross lesions of cerebral hemispheres. More or less marked shrinkage of convolutions of the fronto-parietal lobe over convexity of hemisphere.		1	1	1		.....	1	1		1	.....	1	.....	1	1	1
Gross lesions of cerebral hemispheres. Gross vascular changes of circle of Willis and branches		.....	.....	1		.....	?	1		.....	.....	.....	1	.....	1	1
Gross lesions of cerebral hemispheres. Circumscribed atrophy of right frontal lobe affecting its entire base and anterior half of its convexity.		.....	.....	.....		1				.....	.....	.....	.....	.....	.....	.....
Gross lesions of cerebral hemispheres. Subdural hemorrhage over posterior part of 2nd and 3rd frontal convolutions and lower end of central convolutions.		.....	.....	.....		.....	.....	.....		.....	.....	.....	.....	.....	.....	1
Gross lesions of cerebral hemispheres. Hydrocephalus, probably congenital, apparently confined to the temporo-parieto-occipital lobes leaving out the frontal ones. 850 cc. of fluid escaped from ventricles		.....	.....	.....		.....	.....	.....		.....	1	.....	.....	.....	.....	.....
Cerebellum. *Cyst* of left upper *vermis* and left cerebellar hemisphere, probably congenital		.....	.....	.....		.....	.....	.....		.....	.....	.....	.....	1	.....	.....
Cerebellum. Shrinkage of convolutions of upper vermis		.....	.....	.....		.....	.....	.....		1	.....	1	.....	.....	1	.....
Gross lesions of cerebral axis and cerebellum. Thalamus and geniculate bodies. Marked reduction in the size of one or both *thalami*. Left one smaller.		.....	1	1	.....	.....	.....	.....	.....	1	.....	1	.....	.....	.....	.....
Gross lesions of cerebral axis and cerebellum. Thalamus and geniculate bodies. Marked reduction in the size of one or both *thalami*. Right one smaller.		.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gross lesions of cerebral axis and cerebellum. Thalamus and geniculate bodies. Marked reduction in the size of one or both *thalami*. Both too small.		.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	1	.....
Gross lesions of cerebral axis and cerebellum. Thalamus and geniculate bodies. Marked attenuation of the *pulvinar* on one or both sides. Left one smaller.		.....	.....	.....	.....	.....	1	.....	.....	1?	.....	.....	.....	.....	.....	1
Gross lesions of cerebral axis and cerebellum. Thalamus and geniculate bodies. Marked attenuation of the *pulvinar* on one or both sides. Right one smaller.		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gross lesions of cerebral axis and cerebellum. Thalamus and geniculate bodies. Marked attenuation of the *pulvinar* on one or both sides. Both too small.		.....	.....	1	1	.....	1	.....	.....	.....	.....	.....	.....	.....	1	.....
Gross lesions of cerebral axis and cerebellum. Thalamus and geniculate bodies. Smallness of *external geniculate body* on one or both sides. Left one smaller.		.....	.....	.....	.....	.....	.....	.....	.....	.....	?	.....	.....	.....	.....	.....
Gross lesions of cerebral axis and cerebellum. Thalamus and geniculate bodies. Smallness of *external geniculate body* on one or both sides. Right one smaller.		.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gross lesions of cerebral axis and cerebellum. Thalamus and geniculate bodies. Smallness of *external geniculate body* on one or both sides. Both too small.		.....	.....	?	?	.....	.....	.....	.....	.....	?	.....	.....	.....	1	.....
Gross lesions of cerebral axis and cerebellum. Thalamus and geniculate bodies. Smallness of *internal geniculate body* on one or both sides. Left one smaller.		.....	.....	1	1?	.....	.....	.....	.....	.....	?	.....	.....	.....	.....	.....
Gross lesions of cerebral axis and cerebellum. Thalamus and geniculate bodies. Smallness of *internal geniculate body* on one or both sides. Right one smaller.		.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Gross lesions of cerebral axis and cerebellum. Thalamus and geniculate bodies. Smallness of *internal geniculate body* on one or both sides. Both too small.		.....	.....	.....	1	.....	.....	.....	.....	.....	?	.....	1	.....	.....	?
Gross lesions of cerebral axis and cerebellum. Thalamus and geniculate bodies. Smallness of one or both *anterior tubercles* of the thalamus.		.....	.....	1	.....	.....	.....	.....	.....	.....	1 left side.		1 left side.		1	1

Lab. No. of Case.	No. 4	No. 5	No. 6	No. 9	No. 10	No. 12	No. 13	No. 14	No. 15	No. 16	No. 17	No. 18	No. 19	No. 20	No. 21	No. 22
Itenllectnal state.	Mentally fair some congenital deficiency, can read and write.	Mentally feeble.	Mentally feeble silly talk incoherent.	Progredient dementia.	Progredient dementia.	Marked mental feebleness; progressive.	Mentally feeble; imbecile echo-speech.	Imbecile, idiotic.	.....	Progressively feeble-minded; formerly bright.	Mentally very deficient.	Mental infeeblement, evidently progressive.	Progressive mental enfeeblement.	Imbecile progr.?	Fairly good intellect.	Intelligent.
Emotional state	Obedient well disposed.	Irritable at times.	Usually very talkative, noisy; sometimes depressed. One attack of fury, assaulting.	Much depressed.		Short periods of maniacal excitement, hallucinatory.	Frequently noisy, destructive, aggressive, screaming, agitated.	Contented and harmless.			Very destructive, talkative, restless. Masturbates.	Quarrelsome, irritable, destructive, abusive, vile language.	Periods of maniacal excitement.	Destructive. irritable	Sullen, irritable, extremely quarrelsome.	Shortly before death easily moved to tears.
History or symptoms of focal disease, or of organic nervous disease in general.		See note 2		See note 3	See note 4			See note 5		See note 6	See note 7	See note 8	See note 9			See note

NOTES SUPPLEMENTARY TO TABLE.

Note 1.—Case 16. In this case pia is also thickened, but over different regions and asymmetrically.

Note 2.—Case 5. Exaggeration of deep reflexes on left side.

Note 3.—Case 9. Infantile cerebral palsy at six months, i. e., right hemiplegia. Examination showed athetoid movements of left (or right?) side, athetoid movements of right hand.

Note 4.—Case 10. Spastic ataxic gait "Exaggerated reflexes" on both sides. Temporary paraplegia at age of 21. Syphilitic infection at age of 25 (or earlier?).

Note 5.—Case 14. Spastic gait. No history notes accounting for it.

Note 6.—Case 16. Slight right hemiplegia; defective, uncertain, slow speech. "Exaggerated reflexes." Paralysis came on at age of 3 or 3½ years, during an illness accompanied by high fever and convulsions. Attributed to overdose of opium (?).

Note 7.—Case 17. In this case of hydrocephalus there was divergent strabismus, present since admission and for some hours before death a tonic spasm of right arm and right side of face. Otherwise no reliable date pointing to organic brain lesion.

Note 8.—Case 18. At age of 2½ stroke of right hemiplegia; at 6½ years stroke of left hemiplegia. Both recovered (?). Epilepsy set in after the second stroke. Clinical notes say only: "Exaggerated reflexes."

Note 9.—Case 19. "Left knee jerk exaggerated."

Note 10.—Case 22. Weakness of left arm, chiefly after attacks. Epileptic seizures of Jacksonian type, with preservation of consciousness and involvement almost exclusively of left arm, left side of face and left side of neck. Chancre two years before death. A few days before death he developed thick speech, partial aphasia and paraphasia, disturbance of deglutition and apparent involvement of vocal cords.

Note 11.—Also Case 22. The valvular lesion was here evidently an acute one, possibly a syphilitic one.

discussion. In view of their relative rarity as compared with the thalamic changes, they can not be given as much attention as the latter, but yet should not be allowed to pass without mention.

Claus and Van der Stricht,[9] who discuss the pathology of epilepsy quite extensively, make the following statements on cerebellar changes in epilepsy.

> The sclerotic indurations of the cerebellum are very frequent. They are often found at the autopsies of the epileptics. They have no special significance, they indicate likewise (*egalement*) a more generalized state of sclerosis. If localized exclusively in the cerebellum they can, just like the sclerosis of the cornea ammonis, of the olivary bodies, or of other parts situated outside of the motor centers, have an etiologic significance in the production of epilepsy.

The authors then go on to quote Duquet as having reported three cases of sclerosis of the cerebellum. They further mention Claus as giving the history of a female epileptic whose gait at the onset simply unsteady (*chancelante*) became more disturbed in the further course of the disease. The autopsy revealed a sclerous atrophy of the cerebellum. The cells of Purkinje and the nerve cells of the external layer were also diminished and atrophied.

Finally, Claus and Van der Stricht mention Pierret as quoting without comments a case of peripheral atrophy of the cerebellum with accompanying atrophy of the two olivary bodies and integrity of the rhomboid bodies. They conclude by saying: "We find it useless to multiply these instances."

If I have dwelt at some length on the changes of the cerebellum in epileptics it is because some authors have attributed to the cerebellum a relation to emotions. Close contact with epileptics shows, on the other hand, how frequently in these patients the emotions are at fault. (See table, emotional state.) However, I am fully aware that the small material at hand and the speculative character of the emotion theory of the cerebellum does not permit of any definite conclusions.

DISCUSSION.

DR. DAVID I. WOLFSTEIN, Cincinnati, declared that this paper is valuable, as it certainly supports in a startling way the recent contribution to the study of these cases made by Dr. Starr, in which he made an effort to pick out a class and place them under the head of organic. It seems that in this group there is confirmatory evidence that organic lesions would be found.

DR. WILLIAM G. SPILLER, Philadelphia, stated that he has many brains of epileptics from the Pennsylvania Training School for Feeble-Minded Children, and has observed changes similar to those which have been noted by Dr. Onuf. He does not think it wise to remove the pia, though by so doing better photographs can be made, but one can not then study the condition of the pia. Dr. Onuf's method of hardening the brain has been employed in a somewhat modified form by others. A physician, for the purpose of studying the retina, injected formalin into the eyeball immediately after the death of the patient, and succeeded very well in preserving the nerve cells. Dr. Spiller agreed with Dr. Onuf that it would be well to devote more time to the clinical study of the ocular and aural symptoms.

DR. N. B. ONUF said that in principle Dr. Spiller's objection to removal of the pia is entirely justified. He explained, however, that the removal is not so objectionable as it seems on the surface, since the removed pieces were marked in the relation to the region from which they were taken. The pia was, for instance, removed in a strip over the second frontal convolution, and a note was made which end was the anterior one and which end adjoined the anterior central convolution. In such a manner the pia strips were all marked and removed for future study. Dr. Onuf declared that it is but fair to state that most of these cases were cases of advanced epilepsy with marked mental changes, usually marked dementia, but this does not exclude the possibility of finding such changes also in earlier stages of the disease.

9. Claus and Van der Stricht: Essai sur la pathogénie et le traitement de l'epilepsie, Bruxelles, 1895, p. 165.

CEREBROSPINAL FEVER.

EPIDEMIC CEREBROSPINAL MENINGITIS.

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PHILADELPHIA.

HISTORICAL.

Two diseases have especially excited the interest and baffled the researches of students of epidemiology and clinical medicine. One is influenza, the other epidemic cerebrospinal meningitis. Influenza has occurred in world pandemics which have been succeeded for varying periods extending over years by recurrent epidemics and sporadic cases and finally by periods of apparent absence of the disease until the sudden recurrence of another great pandemic. The opportunities afforded by the outbreak which began in 1889 have resulted in the discovery of the pathogenic agent of influenza—the bacillus of Pfeiffer—in the recognition of the transmissible nature of the infection and of the existence of sporadic cases by which the disease has been maintained for an indefinite time. But the regions in which the organism has continued to exist and the efficient mechanism by which, after long periods of latency, it suddenly gives rise to its pandemic effects, have thus far eluded research.

Epidemic meningitis—cerebrospinal fever—for about a century has been recognized as a substantive disease. Its occurrence in epidemics more or less extensive and prevailing under conditions wholly at variance with those which obtain with other transmissible or contagious diseases, its terrible symptom-complex, high mortality and the desperate state of many of those who survive the attack, together with the fact that the disease remains in sporadic form as a continuing menace to the health of communities in which it has once oc-

curred in the epidemic form, have given it a singular and gloomy position among the pests of mankind.

The preliminary work of Weichselbaum (1887) and Jäger (1895) and the definite report of Councilman, Mallory and Wright (1897) have demonstrated the exciting cause of this specific form of cerebrospinal meningitis to the *Diplococcus intracellularis meningitidis.* A few days ago Councilman[1] published a most important contribution to the bacteriology and pathology of the subject, in which a brilliant side-light is thrown on the obscurities of the disease in certain of its epidemiologic and clinical aspects.

Quincke's lumbar puncture as a familiar procedure in clinical work has proved of inestimable advantage in the differential diagnosis between cases of pneumococcus and streptococcus meningitis and those due to the *Diplococcus intracellularis meningitidis.* Much has thus been done to clear up the obscurities regarding the origin and nature of cerebrospinal fever, but much remains to be done, especially with reference to the cases that are not well characterized and in the direction of treatment. The subject acquires a peculiar interest at this time on account of the epidemic which has prevailed in New York City since February, 1904, resulting in more than 1,000 deaths, the number recently reaching 130 deaths per week, and the evidences of its tendency to spread in Philadelphia since the localized outbreak of 23 cases which occurred at the U. S. Navy Yard at League Island in the spring of 1904. At the present time there are 3 cases in the medical service of the Pennsylvania Hospital. It is also reported that the disease has assumed an epidemic form in some parts of Europe, especially in Silesia.

Cerebrospinal fever may be defined to be an acute, infectious, epidemic disease caused by the *Diplococcus intracellularis meningitidis,* characterized clinically by sudden onset, with headache, vomiting and painful contraction of the muscles of the back of the neck, irregular fever, profound nervous symptoms, rapid course and high death rate; anatomically by inflammation of the meninges of the brain and cord.

This disease was first recognized as a distinct affection about the beginning of the nineteenth century. It is probable, however, that it has existed from a remote period. Vieusseaux described an outbreak which appeared in Geneva in the winter and spring of 1805. The following year an outbreak in Medford, Mass., was described by Danielson and Mann. From that time the disease was extensive in the New England states, prevailing in circumscribed epidemics until 1816. At the same time and subsequently, as shown by Hirsch, the disease prevailed in various parts of Europe and in the United States, chiefly in isolated epidemics. Stillé fully described the disease as it prevailed in Philadelphia and in other parts of Pennsylvania in 1867. In the last three decades scattered cases occurring singly or in small groups have led to the belief that the disease has become naturalized in regions in which it previously prevailed in epidemic form.

Climate appears to have little influence as a predisposing factor. Epidemics have occurred in Sweden and on the Mediterranean coast, and in this country from the Gulf coast to Canada. Outbreaks are more common and extensive in the winter and spring than in the warm seasons of the year. Densely populated cities and sparsely settled agricultural regions are alike subject to its prevalence. Observers concur in the statement that damp, overcrowded and unclean habitations favor its spread and that persons living on the ground floor are especially apt to suffer. In adult life the proportion of males attacked is greater than that of females. Among children the number of males and females is about equal. Cerebrospinal fever is especially a disease of children and young adults. After 40 it is uncommon, though the diagnosis has been verified postmortem in individuals over 70. Individuals of all occupations and professions are liable to this disease. Military life involves a special liability.

1. The Journal A. M. A., April 1, 1905.

COMMUNICABILITY.

Cerebrospinal fever does not appear to be contagious in the sense in which we are in the habit of using the term in speaking of smallpox, scarlet fever and typhus. Councilman, in his first report, states that the evidence, on the whole, is not conclusive that the disease is incapable of being transmitted from one individual to another. The definite micro-organism which causes it is, in the majority of instances, confined to the meninges of the brain and cord, with little or no opportunity of transmission to other individuals. In cases in which there are lesions in the lungs, ears and nose, however, infection of neighboring objects or persons may readily take place. It is important at this point to note the following statement of Councilman in the recent contribution to the subject above referred to:

> The presence of (these) sporadic cases is of importance in the occurrence of epidemics. The diplococcus intracellularis is an organism of feeble vitality; it dies out easily on exposure to drying and light and is incapable of a saprophytic existence. In the absence of intervening infections, it would be impossible for the period of epidemics to be bridged over. Not only this, but there is evidence that this organism can produce other infections and may even live as an inhabitant on the normal mucous membrane.

The older literature contains numerous accounts which suggest the possibility of the specific exciting cause of this disease being communicable from one person to another, or at least portable on the person or among the effects of those who have been exposed to it. Many of these relate to the outbreaks among French troops and are highly suggestive. The two following cases are cited by Hirsch as occurring in the epidemic of West Prussia in 1865:

> On February 8, K., aged 20, fell ill in the township of Sczakau. He was nursed by the girl W., who had hastened to him out of the village of Sullenczyn. After the death of K. his nurse returned home and there died, on February 26, of epidemic meningitis. This was, with the exception of one on January 15, the first fatal case of meningitis in Sullenczyn. To the burial of this maid came the family of the farm-steward K., to Sullenczyn from the township of Podgass, accompanied by the servant D. and the 4-year-old daughter O. of the teacher R. in Podgass. After their return from the funeral a little child of K.'s fell ill and died in twenty-four hours, then the servant D., who died on March 4, and finally the girl R. on March 7.
>
> At another village, two children of one family, aged, respectively, 1½ and 3½ years, died of the epidemic, one on January 27 and the other on February 7. The clothes of the deceased were taken to a neighboring village, and came into the possession of a girl, aged 5 years. She soon sickened of the epidemic and died on February 14.

Stokes reports the following case:

> A child was seized with epidemic cerebrospinal meningitis and died. A second child of the same family was attacked with the malady a few days later. The day following the

attack of this child the mother, who slept in the same bed with it, sickened of the disease.

The next case was observed by J. Lewis Smith:

A boy, 12 years of age, died of cerebrospinal fever and was buried on Saturday or Sunday. On the following Monday the mother washed the linen of the boy, which had accumulated, and within two days was herself affected with the disease. She and her infant, who was also seized with it, died.

The following personal observation is not without interest:

I saw at 8 o'clock in the evening of March 13, 1905, in consultation with a medical colleague, a physician 33 years of age, suffering from fulminant cerebrospinal fever, the first symptoms of which had appeared on the previous evening and which terminated fatally during the course of the night in a little more than twenty-four hours from the onset. This man had been in constant attendance on a patient who had died of malignant cerebrospinal fever of two days' duration about twelve hours before his own sickness began.

In view of the foregoing facts it can not be affirmed that cerebrospinal fever is not under certain circumstances a transmissible disease.

THE SPECIFIC ORGANISM.

Second attacks are exceedingly rare. The Massachusetts report refers to five instances collected from the literature. It is probable that in most cases persistent immunity follows the attack. The pathogenic organism is found in the fluid obtained by lumbar puncture and in the meningeal exudate. The cerebrospinal fluid is usually more or less turbid, sometimes very turbid, especially early in the course of the attack. In a chronic case under the care of my colleague, Dr. Lewis, in the Pennsylvania Hospital, the fluid was turbid when first withdrawn, but perfectly clear on a second puncture made 43 days later, although the symptoms persisted. In one of my own cases in which the duration of the illness could not be determined and the patient prior to his admission to the hospital was supposed to be suffering from uremia, the fluid was perfectly limpid, but showed pure culture of the *Diplococcus intracellularis meningitidis*.

While turbidity of the spinal fluid is of diagnostic importance, its perfect limpidity does not constitute a negative sign, and in either case cultures are necessary to the diagnosis.

The organism grown in pure culture appears in diplococcus form with an unstained interval. It reacts to ordinary stains and is decolorized by the Gram method. It grows best on Loeffler's blood serum mixture. In the tissues the diplococcus is almost constantly confined to the interior of the polynuclear leucocytes. The diplococci are found only in connection with the lesions of the disease. Mixed infections are not uncommon. In the Boston cases the pneumococcus was found seven times, once in connection with Friedlander's bacillus. Terminal infections with staphylococci and streptococci were occasionally found. Lumbar puncture was performed in fifty-five cases and in some of these several punctures were made. Diplococci were found either on microscopic examination or in cultures in thirty-eight of these cases. The average period from the onset of the attack before the puncture was made was seven days in the positive cases and seventeen days in the negative cases. The longest time after the onset in which the fluid drawn by puncture gave positive results was twenty-nine days.

SYMPTOMS OF THE ORDINARY FORMS.

Cerebrospinal fever presents a great diversity of symptoms in different cases. No other acute disease appears in such various guises. Stillé has well called it a "chameleon-like disorder." The period of incubation is unknown. Prodromes are rare. When present they consist of headache, dragging muscular pains, vertigo and a sense of fatigue. The onset of the attack is usually abrupt. It is marked by a chill, agonizing headache, nausea and vomiting. In some cases headache is not a conspicuous symptom. The attack begins with vertigo and the patient acts like a drunken man. This was the mode of onset in a case which I recently had the opportunity of seeing. Presently dragging pains in the neck come on, which spread along the spine and into the extremities and are soon followed by motor symptoms which progressively develop. These consist of titanic stiffness of the spinal muscles, great pain on attempting to bend the head forward or to turn it from side to side and awkwardness and difficulty in movements of the extremities. Strabismus, inequality of the pupils and palsies of the facial muscles are common. In the course of a little time opisthotonos develops, the head is drawn back, the spine curved, the forearms flexed on the arms and the legs on the thighs. Muscular cramps and spasmodic twitchings come and go. In young children general convulsions may occur.

Hemiplegia has been frequently observed. Paraplegia may also occur. Paralysis may develop during the course of the attack and disappear shortly or it may persist for some time.

The sensory symptoms consist of headache, which may be sharp, lancinating or boring and commonly referred to the back of the head; sometimes it is felt as a constricting band; pain in the back of the neck and in the lumbar and epigastric regions and general hyperesthesia, most marked in the face and neck. Various disturbances of the special senses occur. There is a photophobia, intolerance of sounds, ringing in the ears and vertigo.

The physical disturbances are striking. The patient is restless and distressed. His face is seldom flushed, usually pale and slightly cyanotic. In children there is great irritability. Delirium occurs early and may be active, even maniacal or of a busy wandering character. After a time it passes into somnolence or stupor, which may be still attended by more or less restlessness and continual movement on the bed. In the worst cases stupor deepens to coma.

The symptoms referable to the alimentary tract are not characteristic. The tongue is at first slightly covered with a whitish fur. In conditions of great depression it becomes dry and brown and sordes collect. Taste is lost and the patient refuses food; nevertheless the vomiting persists. Constipation is commonly present throughout the sickness. Toward the end of the attack, however, diarrhea and involuntary discharges may take place. The abdomen, as a rule, is neither tender nor tympanitic. Slight, exceptionally marked enlargement of the spleen may be made out.

The fever is generally moderate, very irregular and does not observe a typical course. There are frequent remissions. In some instances fever is slight or absent altogether. On the other hand, the temperature may reach 105° or 106° F. In some cases it abruptly rises before death. The fever, even when intense, may be of short duration. There is no constant relation between the intensity of the febrile movement and the severity of the other symptoms. Defervescence may take place without improvement in other respects, so that there

are cases in which severe nervous symptoms persist for weeks after the temperature has fallen to normal or even to subnormal ranges. Many of the cases show a temperature range of irregularly remittent type. In the milder cases the temperature is sometimes distinctly intermittent. The subfebrile temperatures are sometimes broken by rapid and transient elevations.

The pulse is also irregular. There is no constant correspondence between the pulse and temperature. It may be soft and weak, even slower than in health, and is often intermittent and arythmic. Abrupt changes in the force and frequency of the pulse are common. Change in the frequency from 80 to 100 has been observed in the course of a minute. The rhythm of the respiration may be disturbed and Cheyne-Stokes breathing may occur in the graver cases.

Leucocytosis is present throughout the disease, diminishing toward the end of the attack in cases which recover. In 33 cases in the Boston epidemic in which blood counts were made the maximum number of leucocytes was 31,000, the minimum 9,350. In a case under my observation at the present time there is a leucocytosis of 40.000. Differential counts show that the increase is chiefly due to the polynuclear leucocytes.

Lesions of the skin are common. To their prominence is due the old name of spotted fever. They vary greatly in different epidemics. In many cases they are absent altogether. They have been more frequent in the American and Irish epidemics than on the Continent. They are polymorphous and several different forms may occur in the same case. Herpes is far more common than any other eruption. It usually appears on the lips and nose, but may involve other parts of the face or body and may vary from a crop of a few fine vesicles to an abundant eruption of large vesicles. A petechial rash is frequently observed, and in some instances extensive hemorrhagic areas develop in the skin. The petechiæ often resemble flea-bites. They are distributed in varying numbers over the whole surface, but particularly about the knees and elbows. In some cases the rash is abundant and develops with great rapidity. Patches of erythema, dusky mottlings and rose spots disappearing on pressure, like the rash of enteric fever, have been observed. Among the rarer cutaneous manifestations are urticaria, erythema nodosum, pemphigus and gangrene.

The urine is, as a rule, increased. It may be much increased even with high temperature. The reaction is usually acid. A moderate amount of albumin is frequently present. Recent personal observations lead me to believe that there is a special form of cerebrospinal fever characterized by symptoms of an acute nephritis and corresponding to the renal form of enteric fever—the nephrotyphus of the French. I have seen two such cases in which the urine from the onset was densely albuminous, of high specific gravity and contained epithelial and blood casts and free blood. One of these cases terminated fatally; the other is still under observation. Glycosuria occasionally occurs, and in malignant cases hematuria has been observed. Retention of the urine is common in the graver cases. Polyuria is frequent in children, and in some cases has persisted for years after convalescence.

The eye lesions are referable to three causes. First, neuritis, due to the involvement of the nerve in the exudate at the base without extension of the inflammatory process to either the orbit or the eye. This condition may affect the oculomotor and the optic nerve. Second, inflammation from the meninges may extend directly into the eye along the pia-arachnoid of the optic nerve, causing purulent choroido-iritis and in very rare instances suppuration in the orbit. Keratitis may arise in consequence of an extension of the inflammation from the iris and ciliary region. The third cause is neuritis of the fifth nerve, with destruction of the gasserian ganglion and loss of sensation. To this most of the cases of keratitis and purulent conjunctivitis are due.

Symptoms relating to the auditory apparatus are very common. The auditory nerve is generally swollen and surrounded by the exudate. Extensive degeneration of the nerve fibers is frequently found, the degeneration being most marked in the chronic cases.

The subject has been especially studied by Moos, who found that of 64 cases of meningitis which recovered 59 per cent. were deaf, in 7 per cent. the hearing was impaired and in 31 per cent. it remained normal. Of 43 cases closely investigated, deafness appeared in 2 on the tenth day, 6 on the second, 3 on the third, 17 between the fourth and tenth days and 15 between the fourteenth day and the fourth month. This observer thinks that it is possible that the abortive form of epidemic cerebrospinal meningitis is the cause of many cases of early acquired deafness. Deafness is frequently due to disease of the labyrinth. Otitis media and mastoid disease occur. The diplococci are found in the pus cells.

Coryza has been frequently observed in the course of the attack. Weigert first advanced the opinion that in meningitis the nose forms the portal of entry for the infectious organisms. It may be, however, that their presence is due to an extension from the brain and not to primary invasion. Epistaxis occurs also. In 15 of the Boston cases 10 showed the presence of the diplococci in the nasal secretion, and in 18 cases examined by Scherrer the diplococci were found in the pus cells.

The wasting in severe cases is rapid and extreme. An early, sudden and great loss of strength is a frequent and prominent condition in this disease.

The symptoms may be divided into those due to the inflammatory lesions of the cerebrospinal organs and those due to a general infection. In the malignant cases both these groups of symptoms are of overwhelming severity. In the mild cases the nervous symptoms are predominant. The foregoing symptoms indicate the nature and severity of the disease in its ordinary form.

SYMPTOMS OF THE ANOMALOUS FORMS.

A. *Malignant* (*Meningitis Cerebrospinalis Epidemica Siderans*).—The patient is struck down without warning and speedily falls into a state of collapse. A violent chill is followed by cyanosis, coldness of the surface, profuse perspiration, intense headache which alternates with drowsiness and brief delirium followed by unconsciousness. There may be contraction of the neck. Respiration is slow and labored; the pulse rapid and feeble; the urine scanty and loaded with albumin. Purpuric blotches appear on the surface. Cases of this kind have occurred in many epidemics and with greatest frequency at the beginning of the outbreak. They may occur sporadically. Death may ensue in the course of a few hours.

B. *Abortive* (*Meningitis Cerebrospinalis Epidemica Abortiva.*)—The onset of the attack is severe. In the course of a few days the symptoms subside and convalescence is rapid. Under this head must be included

the mildest ambulant cases. Patients complain of headache, stiffness in the neck and spine and malaise. Vomiting occurs. Fever is, as a rule, absent. Stillé relates the case of a girl who was fully convalescent on the fifth day, and states that he observed many slight but distinctly marked cases that were convalescent within a week. J. Lewis Smith has reported similar cases in childhood. Cases of this kind can only be recognized in the light of a prevailing epidemic.

c. *Intermittent* (*Meningitis Cerebrospinalis Epidemica Intermittens.*)—Intermittent and remittent cases are common. Not only the fever, but other symptoms of the disease show extraordinary exacerbations and remissions, which may be repeated at intervals of twenty-four or forty-eight hours. These cases may be due to successive involvement of areas of the meninges or to fresh growths of the organisms. They rarely, however, present the well-marked periodicity of the malarious diseases.

d. *Chronic* (*Meningitis Cerebrospinalis Epidemica Chronica.*)—Cases of this form occur in all epidemics. The disease lasts, with numerous complications, remissions and exacerbations, for several weeks or in some instances for five or six months. Emaciation is extreme. The symptoms may be due to the persistence of conditions left by the acute attack, such as chronic hydrocephalus or abscess of the brain, or general neuritis.

COMPLICATIONS AND SEQUELS.

Among the complications and sequels are pleurisy, endocarditis and pericarditis. Bronchial catarrh and deglutition pneumonia are very common. Croupous pneumonia has been very common in some of the epidemics. This complication occurs more frequently at the close than at the beginning of an epidemic. This was especially the case in an epidemic observed by Immerman and Heller at Erlangen. It is uncertain whether in some instances the cases of pneumonia reported in connection with epidemic meningitis have been cases of true croupous pneumonia or cases of diplococcus pneumonia. In the Boston epidemic the latter condition was found in 8 cases, in one of which the amount of lung involved was so extensive as to resemble both clinically and anatomically ordinary croupous pneumonia.

Arthritis, commonly slight, but in rare instances suppurative, has been noted. The wrist joints are most commonly involved. I have observed transient, painful swelling, usually involving the wrists or knees, in a number of cases. In the League Island epidemic, among 23 cases there were 8 in which purulent arthritis occurred. Swelling of the parotid glands is an occasional accident of the disease. It may be slight or may run on to suppuration—parotid bubo.

Intestinal catarrh may occur as a complication. Malarial and enteric fever and measles, scarlet fever and cholera have been encountered as intercurrent affections.

The convalescence is irregular and uncertain. After severe cases it is apt to be tardy. Relapses are not uncommon and are often fatal.

Among the more important sequels are prolonged debility and emaciation, palsies and various forms of paralysis, impairment of intelligence in consequence of chronic meningitis and chronic hydrocephalus, especially in children, and more or less complete deafness and loss of vision. General motor weakness and paralysis of individual cranial nerves or of the lower extremities may persist for a long time. They depend on lesions of the brain or spinal cord or pressure exerted by extensive organized inflammatory exudate, or on peripheral neuritis.

The symptoms of chronic hydrocephalus are paroxysmal. They consist of severe headache, intolerance of light and sound, vertigo, pains in the neck and limbs, vomiting, involuntary discharges, convulsions and loss of consciousness. The attacks occur either at long and irregular intervals or in rapid succession. The mental and bodily condition of the patient during the intervals is sometimes such as to lead to delusive hopes of his recovery.

DIAGNOSIS.

The direct diagnosis of cerebrospinal fever by ordinary clinical methods is a matter of difficulty in sporadic cases and at the beginning of outbreaks. The diagnosis of any form of meningitis is occasionally obscure. Sudden onset, chill, fever, vomiting, delirium, tremor and painful rigidity of the back of the neck may occur in pneumonia, the malignant form of variola, typhus and especially in the cerebrospinal form of enteric fever. The phenomenon described by Kernig in 1884 and known as Kernig's sign is found to be present in 80 to 90 per cent. of the cases of meningitis and only exceptionally present in other cases. This test is often attended by evident pain on the part of the patient. Kernig's sign is not available in cases of rheumatic or other forms of arthritis of the knee or hip, myositis, contractions from nervous disease and sciatica.

If meningitis be present there is usually no great difficulty in recognizing cerebrospinal fever during an epidemic. The ordinary and anomalous forms alike show a symptom-complex that in the course of a little time is distinctive. In doubtful cases and, indeed, in all cases when practicable lumbar puncture should be performed. The method is easy and has been shown by experience to be devoid of danger. If carried out early in the attack, at the time when the diagnosis is often as important as it is difficult, the result is commonly conclusive.

If the patient has meningitis the fluid withdrawn is, as a rule, but not invariably, more or less cloudy; if cerebrospinal fever, the *Diplococcus intracellularis meningitidis* (meningococcus) will be found on direct microscopic examination or in cultures. Positive conclusions can only be drawn from positive results. When the result is negative the operation must be repeated.

DIFFERENTIAL DIAGNOSIS.

The differential diagnosis between cerebrospinal fever and the following diseases demands consideration:

1. Pneumococcus Meningitis.—This may occur alone or in connection with croupous pneumonia. The pulmonary lesion may be latent. In fact until very recently this organism was very generally regarded as the cause of epidemic cerebrospinal fever. Symptoms indicating extensive infection of the meninges, of the cord and spinal roots and extension of the infective process along the cranial nerves are less marked or absent altogether. Contraction of the muscles of the neck may be absent, delirium and coma are present and occur early, and this form of meningitis is commonly fatal, while cases of the epidemic form may recover.

2. Streptococcus Meningitis.—This form is secondary to infection elsewhere. Fracture of the skull, especially fracture of the base, local abscess formation, acute endocarditis, erysipelas of the face and scalp, otitis media

with extension to the mastoid or the meninges, are forms of primary infection. Opisthotonos is neither common nor well developed. The symptoms develop slowly and are often for a time obscure. The association of painful rigidity, intense headache and vomiting is not conspicuous. Eye symptoms are common.

3. *Tuberculous Meningitis.*—This, perhaps the most familiar form of meningitis, is to be distinguished from cerebrospinal fever by a protracted period of prodromes, more gradual onset, slower course, slow and irregular pulse, great irregularity of the respiration and the absence of eruption. Antecedent tuberculous disease, failure of health following measles or influenza, tuberculous glands or a hereditary predisposition to tuberculous infection are found in the history of the patient. In children or during the prevalence of an epidemic of cerebrospinal fever and in cases in which the tuberculous process involves the spinal meninges (Hirsch) the diagnosis is far from easy.

4. *The Cerebrospinal Form of Enteric Fever.*—The onset is sudden and the symptoms of the period of invasion are those of cerebrospinal fever. About the end of the first week the cerebrospinal phenomena usually subside more or less abruptly and the subsequent course of the illness is that of an ordinary case of enteric fever.

5. *Scarlet Fever.*—In some instances the sudden onset, high febrile movement, vomiting, convulsions and stupor suggest cerebrospinal fever as it occurs in children. The presence of the peculiar redness of the palatine half arches rapidly followed by general erythematous angina are important. In the course of twenty-four or thirty-six hours the efflorescence will clear up any uncertainty.

6. *Typhus Fever.*—At one time cerebrospinal fever was confounded with typhus or regarded as a variety of that disease. To Stillé is due the credit of having finally settled every question of doubt concerning the identity of these two diseases in this country. They are in strong contrast in respect of their causes, symptoms, course, lesions and sequels.

7. *Hysteria.*—Cases of cerebrospinal fever occurring in nervous females at the close of epidemics or sporadically have presented a delirium so peculiar and an array of symptoms so little characteristic that they have been looked on as manifestations of hysteria. This error in diagnosis is no longer possible.

PROGNOSIS.

In individual cases the prognosis can never be made with certainty. The abortive and fulminant cases run the most rapid course. Hirsch has emphasized the fact that certain cases which at the onset present the symptoms of cerebrospinal fever recover after an illness of a few hours, which terminates in free sweating. The malignant cases, on the other hand, prove fatal in a few hours or two or three days. Moderately severe cases may last one or two weeks or several months. The first week is the time of greatest danger. Symptoms rendering the prognosis unfavorable are intense excitement, early depression, persistent vomiting, irregular respiration and convulsions alternating with coma. The average mortality is about 40 per cent. It varies in different epidemics from 20 to 75 per cent. The mortality in the Boston outbreak was 68 per cent.

Relapses are not infrequent and are often fatal.

Bad as the prognosis in cerebrospinal fever is it is still worse in pneumococcus, streptococcus and tuberculous meningitis, these conditions almost invariably terminating in death.

PROPHYLAXIS.

In times of epidemics cleanliness of dwellings and the avoidance of overcrowding should be instituted in the hope of diminishing the severity and mortality of the disease. The successive attack of different members of a household demands the abandonment of the dwelling and thorough disinfection. Isolation of the patients and sterilization of their clothing should be carried out.

TREATMENT.

The mildest cases require no treatment; the malignant cases react to none. Medicine with all its resources is neither capable of combating the attack nor responsible for its results. Of this group of cases Stillé has said "the first symptoms of the disease are the first phenomena of death."

The room occupied by the patient should be darkened and quiet. The diet should consist of milk, eggs, meat juice and broths administered at regular intervals. When food can not be taken by the mouth, nutritious enemata should be given. Water should be freely administered. Alcohol is to be given when the symptoms of depression appear, whether at the onset of the attack or later. A guide as to its amount is the effect on the character of the pulse and the first sound of the heart. Venesection, generally practiced in the early history of the disease, is in no case admissible. On robust individuals wet cups may be applied to the nape of the neck and along the spine or leeches to the temples and in the neighborhood of the mastoid process. The continuous direct application of cold to the head and spine by means of ice-bags is of value. The pain is relieved and in some instances quietude and sleep ensue. If the temperature be high systematic cold bathing may be practiced. During the application of cold to the head and spine and after cold bathing the patient should be covered with warm blankets and artificial heat applied to his sides, thighs and extremities. Warm baths, 104° F., of ten minutes' duration, have been recommended. Blisters applied to the occiput and nape of the neck early in the attack have appeared to be of service. They should be carefully watched and immediately removed on the development of signs of vesication, which is liable to be followed by troublesome sloughing. The thermo-cautery may be used.

Laxative doses of calomel should be given early in the attack. Quinin has been extensively employed. There is no evidence that it exerts a favorable influence, much less that it is capable of aborting the disease. Opium may be regarded as one of the indispensable remedies in the treatment of epidemic meningitis. The indications for its use are to be found in the headache and spinal pains, restlessness, spasm, hyperesthesia and sleeplessness. It should be given early and in full doses. Experience has demonstrated a remarkable tolerance for this drug in cases of cerebrospinal fever. Strong gave in one case 60 drops of laudanum every half-hour until half a fluid ounce was taken. Some of the early American physicians gave enormous doses, half an ounce of the tincture of opium or from 30 to 60 grains of the crude drug in the course of twelve hours. These large doses were frequently followed by recovery. Stillé gave one grain every hour in grave cases and every two hours in moderately severe cases without even an approach to narcotism. He adds that "under the influence of the medicine the pain and spasms subsided, the skin grew warmer and the pulse fuller, and the entire condition of the patient more hopeful." Morphia may be administered hypodermically

in doses of from 1/6 to ½ grain. With great restlessness and jactitation hyoscin hydrobromate is indicated. In the case of children the dose must be cautiously regulated.

Ergot, belladonna, cannabis indica, gelsemium, chloral, zinc oxid and the bromids are of inferior value. They are frequently, however, given in connection with opium or morphia. Inhalations of ether or chloroform may be cautiously employed to secure temporary relief from torturing pain, jactitation and spasm. Veratrum viride and aconite are mentioned only to condemn their use in this disease. The modern analgesics may be employed alone or in conjunction with opium and its derivatives in the management of the milder cases of the disease. Large doses are to be avoided.

℞ Phenacetini ..... 3|
Chart No. viii.
Div. S. One powder q. tertia vel quarta hora.

℞ Pactophenini ..... 2|
Sacch. alb..... 1|
Chart No. vi.
Div. S. One powder q. t. v. q. h.

℞ Antipyrini ..... 3|
Sacch. alb..... 1|
Chart No. viii.
Div. S. One powder q. t. v. q. h.

If the headaches and pains increase cerebrospinal fluid may be withdrawn by lumbar puncture in order to diminish the intracranial pressure. Performed early in the course of the disease and repeated at intervals, it has been frequently followed by beneficial results.

Manges has reported 3 successful cases treated by the injection of lysol in 1 per cent. solution into the spinal canal after the removal of the exudate. This method was originally suggested by Carlos Franca at Lisbon in 1903. Wolff, of Hartford, Conn., basing the procedure on an antagonism which he found to exist between the *Diplococcus intracellularis* and the Klebs-Loeffler bacillus and the fact that the former were precipitated from active bouillon cultures on admixture with diphtheria antitoxin serum, was led to use the antitoxin in the treatment of this disease with satisfactory results, and Waitzfelder[2] treated 17 cases in the same manner, employing from 4,000 to 10,000 units, according to the age of the patient and the severity of the symptoms, at intervals of two or three days. Of his 17 cases, 5 recovered completely, 3 died and 9 were still under observation at the time of the publication of the report, 5 of the last "giving promise of speedy recovery." These observations are now being extensively repeated. In two cases of which I have knowledge the antitoxin treatment was employed without result, but these two cases were of fulminant type, one dying at the end of forty-eight hours and the other in a little more than twenty-four hours.

During a period of depression stimulants are to be freely given. Preparations of alcohol, ammonium carbonate and the spirit of chloroform are recommended. Cold effusion may be occasionally practiced.

During convalescence the bitter tonics and iron may be given. Cod liver oil and iodid of potassium are also employed. Delirium, spasm and irritability of the stomach too often in the severe cases render the administration of medicine and food impracticable. As recovery takes place the appetite is often excellent and an abundant, easily digested and nutritious diet of mixed solid food should be given.

2. Med. Record, N. Y., March 11, 1905.

THE ACTION OF THE INTRACELLULAR POISON OF THE COLON BACILLUS.*

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It is now generally conceded that the pathogenic bacteria bring about those changes in the body cells which form the basis of what we call disease by virtue of certain poisons which they produce. These poisons are supposed to be specific for each kind of bacteria and to them the name of toxin has been given. Certain bacteria possess a toxin which is not an integral part of the cell itself, and hence is not essential to its existence. As examples of such organisms may be mentioned the bacillus of tetanus and that of diphtheria.

With these bacteria the toxin is found free in the culture medium and there are differences in opinion concerning its origin, some regarding it as a cleavage product formed by the action of the bacillus either directly or through a chemical ferment on the constituents of the culture medium, while others think that the soluble toxin represents a group of the bacterial cell which easily drops off. On the other hand, the filtrates of cultures from such bacteria as the typhoid and the colon bacillus are non-toxic, or, at the most, possessed of but feeble toxicity. In the later instance the poison exists as an integral portion of the bacillus itself and can be set free only on the death of the latter. We therefore have two distinct classes of so-called specific bacterial poisons, the one being easily cast off from the living cell and hence called an extracellular toxin to distinguish it from the toxin which can not be split off from the bacterial cell without destroying the latter, the intracellular toxin.

That the colon bacillus, when introduced into the animal body, is one of the most deadly of all bacteria is a fact which is too well known to require further proof. There is no other germ which causes more anxiety to the abdominal surgeon, and the fatal results following typhoid perforation, strangulated hernia, and appendicitis when left to pursue their course uninterruptedly are in almost all instances due to its ravages.

The colon bacillus is a normal inhabitant of the intestinal canal, and so long as it remains within the canal it is practically outside of the body and can do no harm. When it obtains an entrance into the peritoneal cavity, however, it multiplies and at the same time is disintegrated by the protective agencies of the body. As it is broken up, its intracellular poison is set free and then, and not until then, is it capable of acting on the body of the host. It is not, therefore, from the growth of the bacterial cell in the peritoneal cavity that death directly results, but rather from its destruction. Primarily, of course, it is essential that the growth of the organism should have advanced to such a degree that enough bacterial cellular substance shall be present to furnish a sufficient quantity of the poison to cause a fatal issue in the body on its liberation. The necessity of employing a large amount of the living culture in order to obtain a fatal dose of poison from it has long been urged as one of the principal arguments against the intracellular poisons being true toxins. As compared with diphtheria and tetanus, this is, indeed, true, but the comparison is hardly a fair one. Thus, in the case of the diphtheria bacillus, the same germ may go on producing toxin without loss of life, for all one knows, indefinitely, whereas, in the case

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of the colon bacillus, the bacterial cell must die and undergo disintegration before its toxin can be liberated, and then only a definite amount can be obtained from each bacillus.

It is not the purpose of this paper, however, to prove absolutely that the intracellular poison of the colon bacillus is a true toxin but to show that such a poison can be obtained and to compare its action on the animal body with that of the living organism. Whether or not this poison is a true toxin will be discussed when we take up the subject of immunity in a later paper. The fact that a potent intracellular poison can be obtained from the colon bacillus is of especial interest, since several authors have recently denied the existence of the so-called endotoxins, affirming that the colon and typhoid germs cause disease in the same manner as does the diphtheria bacillus, by the production of soluble poisons within the body of their host. These authors explain the absence of such poisons from artificial cultures on the ground that the medium is not suitable for their production, and that consequently the soluble toxins are elaborated solely within the animal body. It is needless to state that such a theory rests almost entirely on negative evidence and if it can be conclusively shown that the colon bacillus, when grown on artificial media, does produce a powerful poison which causes death in much the same manner as does the living germ, the endotoxic explanation would seem to be much more plausible. In discussing the action of the intracellular poison of the colon bacillus, it will be found convenient to take up the action of (1) fatal doses of living cultures, (2) fatal doses of the dead germ substance in which the poison still exists in the bacterial cell, which has, however, been deprived of life; (3) doses of the poison obtained by chemically splitting up the bacterial cell by boiling with a 2 per cent. solution of sodium hydrate in alcohol. In this case the poison is obtained in a comparatively free form.

THE ACTION OF THE LIVING GERM.

When a guinea-pig is inoculated with a fatal dose of the living colon germ, practically no symptoms whatever are noticeable for a period varying from five to seven hours, according to the size of the dose given. This may be considered as the period of incubation and is roughly proportional to the amount of living germ injected. We have always worked with a bacillus 1 c.c. of a 12-hour or older, bouillon culture of which has invariably proved fatal for guinea-pigs within 24 hours. If 1 c.c. of such a culture is given, no effects will be seen for a period of from 10 to 12 hours. If, on the other hand, 2 c.c. of the same culture be injected, the animal will begin to manifest symptoms of illness in from 8 to 10 hours, and if still larger doses are given the symptoms will become apparent in a still shorter time. This period of incubation undoubtedly represents the time taken for the bacillus to multiply and to be destroyed to such an extent that sufficient poison may be liberated through its disintegration to produce noticeable toxic effects in the animal. This period of incubation is, therefore, in reality the crisis of the disease and the outcome depends solely on whether all germs have been destroyed before a lethal dose of the poison has been set free or not. It is during this period that individual resistance and acquired immunity are important factors acting by causing increased bacteriolysis and the destruction of all germs before a fatal dose of poison has been set free. During this time the temperature of the animal may rise to a greater or less extent or may remain stationary; the animal remains active, eats; its coat is not roughened and it appears in all respects as well as a normal animal. At the end of this period, however, the appearance changes. The animal becomes less active, it remains in one corner of its cage; its coat becomes roughened; it hangs its head and apparently enters into a state of stupor. At the same time the rectal temperature begins to fall abruptly, as can be seen from a study of Chart 1.

Indeed, this fall of body temperature is often the first marked symptom and, when occurring to a marked degree, it is invariably a bad omen. The body temperature will often fall from 101 F. to 94 F. or even lower within from 2 to 4 hours, and this fall is progressive and continuous until the animal's death, immediately preceding which a temperature as low as 87 F. or 86 F. is not uncommon. At the same time the animal shows signs of the most marked peritoneal inflammation, as is evidenced by rigidity and spasm of the abdominal muscles on pressure. At autopsy, the only gross lesion present is a marked hemorrhagic peritonitis with a large amount of bloody fluid containing intact red corpuscles and leucocytes in the peritoneal cavity.

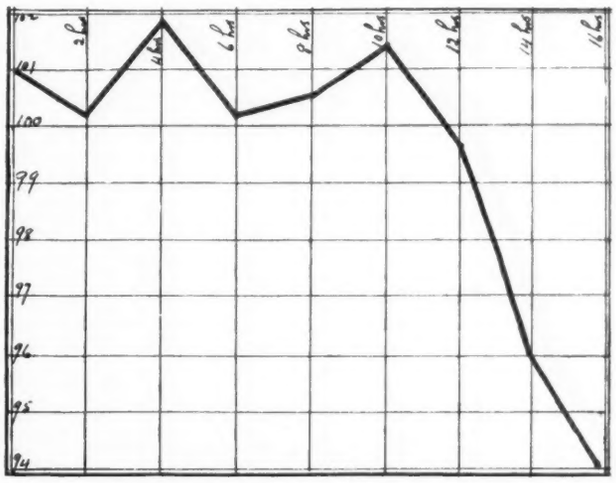

Chart 1.—Temperature curve of guinea-pig after inoculation with 1 c.c., 16 hr. bouillon culture of the colon bacillus. Death occurred 20 hours after inoculation.

The parietal and visceral peritoneum are studded with minute punctiform hemorrhages. Hemorrhage is an especially prominent feature in the great omentum and is present to a less marked degree in the mesentery.

THE ACTION OF THE DEAD GERM.

The dead germ substance used in the following work was obtained by growing a large amount of the colon germ on tanks filled with agar for a period of two weeks at room temperature. At the end of this time the growth was removed from the tanks and extracted with absolute alcohol and ether. The crude bacterial substance thus obtained was reduced to a fine powder by pulverization in an agate mortar and was then ready for use.

It is interesting to note that the person who did the pulverizing was often quite seriously poisoned during the process unless he took the precaution of wearing a mask which hindered the inhalation of the powder. The symptoms of such poisoning were exceedingly interesting. The first thing noticed was a marked irritation of the nasal mucous membrane and a huskiness of the voice, due no doubt to the mechanical irritation

of the inhaled powder. This was followed by a feeling of depression and malaise, and chilly sensations. Occasionally a decided chill would be experienced. It is unfortunate that no accurate observations of temperatures were taken in these cases. Nausea and even vomiting were occasionally noted. After a period of discomfort varying from 6 to 10 hours, during which the patient often complained of dull pain in the various joints, recovery would rapidly and completely take place.

On examining the powder obtained in this manner microscopically we found that it consisted of colon bacilli which still retained their morphologic characteristics and could still be stained by anilin dyes. On the other hand, cultures made from this powder have, of course, never given a growth. In other words, the bacillus has not been broken up by this treatment, but simply has been deprived of life and of the power of reproduction. It is worthy of note that neither by the action of alcohol, ether, physiologic salt solution, distilled water nor any simple solvent have we been able to extract a poison from the colon bacillus. Nor, again, can a poison be split off by the action of heat even when the germ substance is heated to 184 degrees C. in a sealed tube for 30 minutes. It is only when we make use of agents which will chemically break up the colon bacillus that we are enabled to obtain a poison apart from the rest of the germ substance. The powdered germ substance is not soluble, but can be held in suspension in normal salt solution and, since it can be boiled without appreciably affecting its toxicity, suspensions were always heated to 100 degrees for 15 minutes before injection in order to insure sterility.

This coarsely powdered germ substance killed guinea-pigs when injected intraperitoneally in doses of 1 to 40,000, body weight, and invariably proved fatal within 12 hours, usually causing death at the end of from 6 to 8 hours. Smaller doses did not produce a fatal result. On the injection of a fatal dose of the germ substance intraperitoneally, we noticed that the most marked change was in the length of the period of incubation. Thus, whereas in the case of the living germ from 8 to 12 hours passed before noticeable symptoms appeared, in that of the dead germ substance the animal almost invariably showed symptoms of illness at the end of 4 hours. In regard to the character of these symptoms it may be stated that they are similar in all respects to those induced by the living germ. The temperature remains the same or may rise slightly during the first two hours. At the end of the 4 hours it has begun to fall and there is a decided drop from then on until the time of death, provided the dose given is a fatal one. If a non-fatal dose has been injected intraperitoneally the temperature, as will still be seen from reference to the accompanying chart, has reached a minimum at the end of from 6 to 8 hours and has returned to normal again in from 12 to 20 hours.

Moreover, as a general rule, it may be stated that the fall in temperature in non-fatal cases seems to be directly proportional to the amount of bacterial substance injected. That this should be the cases seems to be only natural when we consider the fact that in this instance we have largely done away with that factor which is known as the individual resistance of the animal. As has been previously mentioned in the case of the living bacillus, the individual resistance plays an important part in determining the amount of poison which will ultimately be set free in the body. For example, whereas 1 c.c. of a 12-hour culture of our colon bacillus invariably proved fatal, .25 c.c. never did. The explanation of this is to be found in the fact that all animals were able to cause disintegration of all bacilli injected before a fatal dose of poison was set free. If now .5 c.c. be given some would recover, while others would die. In this case we would speak of the former as possessing a greater individual resistance than the latter. This simply means that, in the first instance the animal has possessed a sufficient quantity of bactericidal substance directly available to cause disintegration of all bacilli before the latter have multiplied to a sufficient extent to furnish enough poison to kill the animal on its liberation. On the other hand, those animals which succumbed did not possess quite enough of the bactericidal substance, or at least did not possess it in a form available for immediate use. When, however, the dead bacterial substance is given the dose of poison which the animal receives is a certain definite amount and is not capable of subsequent increase.

Accompanying the fall in temperature there is apparent lassitude, stupor and roughening of the coat. In cases in which many times the fatal dose has been given, the animals occasionally die within from 4 to 6 hours with convulsions, a feature which can now and then be observed after the injection of large quantities of the living bacillus. At autopsy we find a picture similar in all respects to that following inoculation with

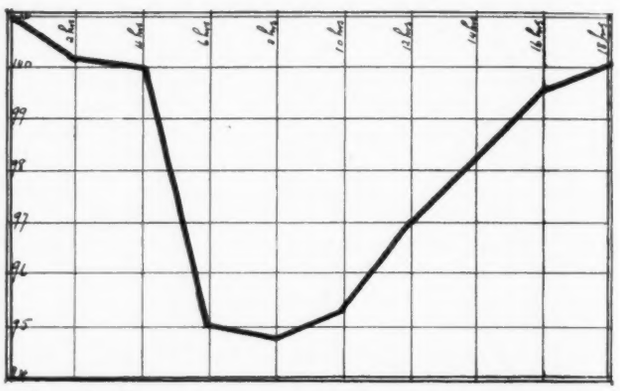

Chart 2.—Temperature curve of guinea-pig after intraperitoneal injection of non-fatal dose of crude bacterial cell substance.

the living colon bacillus. There is a marked hemorrhagic peritonitis, the peritoneal cavity containing bloody fluid, together with unabsorbed bacterial cell substance, and the omentum and mesentery showing numerous punctiform hemorrhages. It is needless to state that in all cases cultures were made from the peritoneal cavity and heart's blood immediately after death, and these proved to be sterile. From this we see that practically the sole difference between the effects following inoculation with the living bacillus and the injection of the dead bacterial substance is a shortening of the period of incubation due, no doubt, to the fact that the intracellular poison is liberated much more rapidly and in greater concentration in the second case. As will be seen later, it is not so much the absolute quantity of the poison which is injected that determines the result, as the amount which is active at a given time.

THE ACTION OF THE SOLUBLE POISON.

On heating the crude bacterial substance used in the above experiments with a 2 per cent. solution of sodium hydrate in absolute alcohol, precipitating with hydrochloric acid to remove the excess of sodium and evap-

orating the filtrate *in vacuo*, a residue is obtained which can be reduced to a powder which is freely soluble in water. The resulting solution is acid in reaction, and consequently is rendered neutral or slightly alkaline with sodium bicarbonate before it is injected into animals in order to avoid possible irritative effects from the acid. It may be stated here that all the poison contained in the colon bacillus is present in this portion, the residue after extraction with the sodium in alcohol being possessed of no toxic properties whatever. The poison is not obtained in a pure state and, as has been seen in the paper by Dr. Wheeler, it probably makes up but a small portion of the powder, there being more or less sodium chlorid certainly, and other constituents of the colon bacillus itself probably, present. Although we are certain that the poison is not pure, for reasons which will appear later, we are inclined to believe that it exists in an uncombined or very loosely combined state.

When doses of this powder are given intraperitoneally in amounts varying from 8 to 60 milligrams, according as to whether we have been careful to remove most of the common salt or not, a fatal result follows in guinea-pigs in from 30 to 60 minutes. Within 15 minutes after injection the temperature begins to fall and sometimes within half an hour has reached 94 F. or even lower. At first, after an interval of from 5 to 10 minutes immediately following the injection the animal appears restless, runs about the cage and shows a great tendency to scratch itself, this undoubtedly being due to itching sensations in the skin caused by irritation of the peripheral nerves. The animal then begins to show evidence of lack of co-ordination, which is rapidly followed by partial paralysis, which is especially marked in the hind extremities. This stage lasts for from 5 to 10 minutes, during the later part of which the animal usually lies quietly on one side. From this state the animal passes into what one might term the convulsive stage. These convulsions are usually clonic in nature and, as a rule, at first involve only the neck muscles, the head being momentarily drawn backward on the back. At first these convulsions are but slight in degree and are separated by considerable intervals of time. Soon, however, they become much more frequent and of much greater severity. Gradually they become more and more general in their extent until all the muscles of the body become involved in violent clonic convulsions. This stage when present invariably presages a fatal outcome. During a convulsion, or occasionally in the interval of calm, respiration ceases. The heart, however, continues to beat, at first with perfect regularity and no acceleration; indeed, the rate seems to be somewhat slower than normal. Gradually the beat becomes more and more feeble, the rate and regularity being preserved to the end. It is usually only after an interval of from 3 to 4 minutes after the cessation of respiration that the heart ceases to beat. As has been previously stated, a fatal issue, if it occurs at all, always results within one hour after injection and usually within from 30 to 40 minutes. This is to a large extent independent of whether the dose is the minimum lethal one or two or three times that amount. It is certainly entirely independent of the size of the pig. Death, of course, results at slightly different times with different batches of the poison, but even in this case the interval of time between injection and a fatal issue does not vary to any great extent. A dose which has proved to be the minimum fatal dose for one pig will almost surely prove to be the same for another. In other words, we have done away practically entirely with the period of incubation, and the poison acts so rapidly that individual resistance plays no part; hence, the animal acts almost with the exactitude of a chemical compound into which for all practical purposes it has been converted. The period of incubation has ceased to exist since the poison is no longer contained within either the dead or the living bacillus, but is present in a free and uncombined form, capable of uniting immediately with those body cells for which it may possess a special affinity.

At autopsy no special gross lesions can be made out. The peritoneum is smooth and shiny throughout and there is not the slightest evidence of either hemorrhage or even marked congestion in the omentum or mesentery. This is a very important feature and in marked contrast to the hemorrhagic peritonitis found after injection of either the living or the dead colon bacillus. We are inclined to believe that it is the distinguishing feature between the injection of the poison in a comparatively free and in a combined state. At one time we attempted to obtain the poison by a simpler method, omitting the extraction of the crude substance with ether. The result was that on evaporation of the alcoholic filtrate we obtained a sticky residue which it was utterly impossible to pulverize or to weigh. We were compelled, therefore, to content ourselves with evaporating it to a sticky mass, which was then immediately dissolved in water. The solution of the poison thus prepared was very toxic but, as a rule, took from one to two hours or even longer to bring about a fatal result. The animals showed the roughening of the coat and the stupor characteristic of the living and dead bacillus, but not as a rule seen in the case of the powdered poison. Furthermore, the majority of these animals showed during life unmistakable signs of peritoneal inflammation. They died in convulsions. At autopsy an intense hemorrhagic peritonitis was present, which was particularly prominent in the omentum and mesentery, and hemorrhage was often present in the capsules of the liver and the spleen. From the fact that death was slower in these cases and that the symptoms were more like those seen after inoculation with the living bacillus, we are inclined to believe that in this instance the poison, although split off from the bacillus itself, still exists in combination with some other cell group and that it is essential that this combination be broken up before the poison can be set free and can act on the body cell.

Another interesting fact in this connection is furnished by the action of the poison in solutions which have been rendered strongly alkaline by the addition of sodium bicarbonate. As has been previously stated, the aqueous solutions of the poison are slightly acid in reaction and in order to avoid the irritative effects which might follow their injection into the peritoneal cavity, they were neutralized or rendered slightly alkaline by the addition of sodium bicarbonate. At first no attempt was made to secure perfect neutralization, with the result that sometimes we were making use of neutral, while again slightly or decidedly alkaline solutions were employed. It was soon noticed, however, that the results obtained in the three cases were very different. Thus, whereas in the neutral or faintly alkaline solution the injection of 60 mgs. of the powder invariably killed, in the case of a stronger alkaline solution the same amount did not cause a fatal result, although

the animals were very ill. From this fact it became evident that some change had taken place in the poison on standing in alkaline solution. In order to study this change more in detail, experiments were conducted with solutions of different degrees of alkalinity, with the results found in the following tables:

TABLE 1.

RESULTS WITH SOLUTION OF POISON BARELY NEUTRALIZED WITH SODIUM BICARBONATE AND PLACED IN INCUBATOR.

No. of Animal.	Dose of Poison.	Solution Kept in Incubator.	Weight of Pig.	Result of Injection.	Time of Death After Injection.
1	60 mgs.	Fresh.	325 gms.	+	30 minutes.
2	60 mgs.	2 hours.	330 gms.	+	20 minutes.
3	60 mgs.	20 hours.	370 gms.	+	20 minutes.
4	60 mgs.	2 days.	320 gms.	+	15 minutes.
5	60 mgs.	4 days.	350 gms.	+	20 minutes.
6	60 mgs.	6 days.	350 gms.	+	45 minutes.
7	60 mgs.	8 days.	320 gms.	+	20 minutes.

TABLE 2.

RESULTS WITH SOLUTION OF POISON RENDERED DECIDEDLY ALKALINE WITH SODIUM BICARBONATE AND PLACED IN INCUBATOR.

No. of Animal.	Dose of Poison.	Solution Kept in Incubator.	Weight of Pig.	Result of Injection.	Time of Death After Injection.
1	60 mgs. (barely neut.)	Fresh.	350 gms.	+	30 minutes.
2	60 mgs. (decidedly alk.)	Fresh.	370 gms.	Very sick for 2 hrs. [sick.	Recovered. Recovered.
3	60 mgs.	2 hours.	325 gms.	Not very	
4	80 mgs.	4 hours.	310 gms.	Sick.	Recovered.
5	120 mgs.	24 hours.	280 gms.	+	More than 5 hours.
6	160 mgs.	3 days.	350 gms.	+	7 hours.

TABLE 3.

RESULTS WITH SOLUTION OF POISON RENDERED DECIDEDLY ALKALINE WITH SODIUM BICARBONATE AND KEPT AT ROOM TEMPERATURE.

No. of Animal.	Dose of Poison.	Time at Room Temperature.	Weight of Pig.	Result of Injection.	Time of Death After Injection.
1	60 mgs.	Fresh.	350 gms.	+	35 minutes.
2	60 mgs.	12 hours.	265 gms.	Sick.	Recovered.
3	90 mgs.	2 days.	280 gms.	Sick.	Recovered.
4	120 mgs.	2 days.	460 gms.	+	20 minutes.
5	120 mgs.	7 days.	405 gms.	Sick for 5 hours.	Recovered.
6	160 mgs.	7 days.	440 gms.	Sick for several hours.	Recovered.

From the above tables it will be seen that the degree of alkalinity of the solution, and especially the length of time that the poison has stood in alkaline solution are very important factors in determining its toxicity. Thus in Table 1, in which the solution was barely neutralized, the poison seems to have retained its full potency after eight days in the incubator, whereas, in the case of the strongly alkaline solution, the potency has decreased markedly within from 24 to 48 hours. Again, there are great differences to be seen depending on whether the strongly alkaline solution has been kept at room temperature or at that of the incubator, the decrease in toxicity being much less rapid in the first instance.

A more detailed result of the effects on animals than it was possible to give in the above tables is not without interest. For example, in Table 2, No. 2, which received 60 milligrams immediately after the solution had been rendered decidedly alkaline, was very sick indeed, whereas No. 3, which received the same amount after two hours in the incubator, was only slightly affected. In the case of Nos. 5 and 6 the effects observed corresponded more closely to those obtained with the crude bacterial cell substance. It is unfortunate that the time of death was not ascertained in the case of No. 5. No. 6 did not succumb until seven hours after the injection. On autopsy there was considerable fluid in the peritoneal cavity and the vessels of the mesentery were markedly congested. The omentum was particularly injected and a few minute hemorrhages could be made out. The most plausible explanation of the above facts is found in the theory that the poison has not been destroyed in the alkaline solution but rather has entered into chemical combination with the alkali and that we are again dealing with it in a combined instead of in a free state. The fact that the same amount will not cause a fatal result is thus readily explained, since the outcome depends largely on the rapidity with which the poison acts. If it is present in a state of combination which must be broken up before it can exert its deleterious action on the body, and if this combination is only slowly decomposed, the nerve cells, for which it apparently has a special affinity, are not subjected to an overwhelming dose at one time, as in the case of the intraperitoneal injection of the free poison.

The results obtained in animals Nos. 5 and 6, Table 3, are very interesting. In these instances there were two distinct illnesses, the first becoming manifest within from 20 to 30 minutes after the injection and corresponding in all respects to that following a non-fatal dose of what we have for convenience termed the free poison. The animals were decidedly in better condition at the end of an hour; however, they then began to show symptoms similar to those noticed after the injection of the crude cell substance, i. e., roughening of the coat, stupor and slight convulsive movements. Recovery from this state did not occur until after the lapse of from 5 to 6 hours. It is evident that here the first signs of illness were due to some of the poison which had not as yet combined with the alkali and hence still existed in the free state, whereas the later symptoms were due to the effects of the slow liberation of the same poison from its combination. In this connection it is interesting to note that the combination between the poison and the alkali which apparently takes place in decidedly alkaline solutions is not an immediate one but occurs gradually and reaches a maximum only after the lapse of a considerable interval of time. That the rapidity with which this combination is effected depends largely on temperature is shown by the fact that it occurs much more rapidly in a solution kept in the incubator than in one which is allowed to stand at room temperature.

The results which follow the injection of a fatal dose of the soluble poison intraperitoneally have already been described. When a non-fatal dose has been injected the symptoms first noticed are similar in all respects to those following a fatal dose. The animal becomes restless, shows signs of irritation of the peripheral nerves, inco-ordination and partial paralysis. The convulsive stage is not present, as a rule, and when it is noticed is evidenced solely by slight movements separated by considerable intervals of time. We have never seen a case showing marked generalized convulsions which recovered. Recovery is apparently rapid and complete and within two hours after injection the animal which has been desperately ill appears as well as any untreated animal. The maximum effect is obtained within from 45 to 60 minutes in every instance. The study of the changes in temperature in these animals is particularly interesting. Within 15 minutes the rectal temperature has begun to fall and has reached a minimum within one hour.

It remains stationary for a short time and then be-

gins to rise again and at the end of three hours after the injection has usually returned to normal or above.

On injecting the soluble poison subcutaneously, we find that the animals are able to withstand a much larger dose than when the poison is given intraperitoneally. Thus, in the case of a poison, 60 mgs. of which invariably killed when given intraperitoneally, it was found that 120 mgs. could be given subcutaneously without causing a fatal result. However, the injection of a solution containing 180 mgs. invariably caused death, the fatal issue occurring in about the same length of time as in the case of animals treated intraperitoneally. Thus, a dose of 180 mgs. always proved fatal in from one-half to three-quarters of an hour. The symptoms are practically identical with those following the intraperitoneal injection with the exception of the fact that the various stages are much more sharply defined. For example, the stage of peripheral irritation is much more marked. The animal soon after

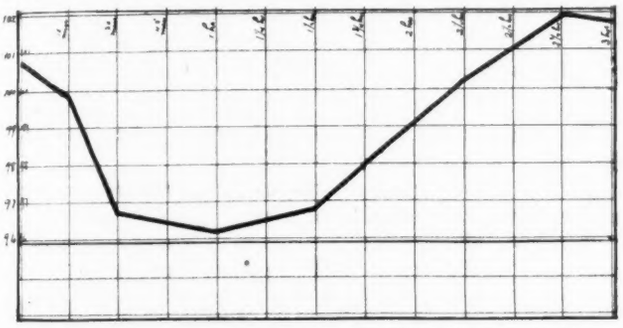

Chart 3.—Temperature curve of guinea-pig treated with 45 mgs. of the soluble poison intraperitoneally.

injection becomes very restless, runs around his cage and scratches his body. This itching seems, however, to be general from the outset and is not, apparently, more pronounced in the immediate neighborhood of the site of injection. If the animal has been injected under the skin of the abdomen, his attention is not necessarily first attracted to this spot, but he may begin by scratching his nose or one of the extremities. Another peculiar symptom, which is probably due to peripheral irritation and which is seldom seen in cases of intraperitoneal injection, is the tendency which the animals show to dig furiously in the shavings in the bottom of their cages. This feature is quite characteristic and is seldom absent in pigs which have been treated subcutaneously. The later stages are similar in all respects to those seen following the intraperitoneal injection. The animal shows symptoms of inco-ordination, lies on one side and finally develops convulsions, with failure of respiration, the heart continuing to beat regularly for some time after the complete cessation of respiration. Here also the symptoms are accompanied by a decided fall in the body temperature.

The results following the intravenous injection of the soluble poison are given in the following table:

TABLE 4.

No. of Animal.	Amount of Poison Injected Intravenously.	Time of Cessation of Respiration After Injection.	Time of Cessation of Heart Beat After Injection.
1	10 mgs.	4 minutes.	7 minutes.
2	10 mgs.	Recovered.	
3	10 mgs.	3 minutes.	6 minutes.
4	10 mgs.	Recovered.	
5	15 mgs.	4 minutes.	6 minutes.
6	15 mgs.	3 minutes.	5 minutes.
7	15 mgs.	4 minutes.	7 minutes.
8	15 mgs.	4 minutes.	6 minutes.
9	20 mgs.	3 minutes.	5 minutes.
10	20 mgs.	4 minutes.	6 minutes.
11	20 mgs.	3 minutes.	6 minutes.
12	20 mgs.	3 minutes.	7 minutes.

From the above table it will be seen that in all cases respiration ceased within four minutes after injection. Indeed, the respiratory embarrassment becomes pronounced immediately following the injection. The animal struggles for breath and there is violent retraction of the sternum. No convulsions are seen following the intravenous injection, this being probably due to the inhibitory influence of the anesthetic which has been used during the preparation of the animal for the operation. The failure of respiration in the absence of convulsions would seem to be conclusive evidence that the cessation of this function is due not to mechanical interference during a convulsive attack but to a direct paralysis of the respiratory center itself. Furthermore, the fact that the heart continues to beat in a perfectly normal manner for from two to four minutes after respiration has entirely ceased would tend to show that the immediate cause of death is asphyxia brought about by paralysis of respiration through the action of the poison.

This action of the heart after the cessation of respiration is exceedingly interesting, and is entirely analogous to that mentioned as following the intraperitoneal injection. The rate of the beat is decidedly lessened and at first the individual beats are stronger. They gradually become more and more feeble, however, until finally the heart stops in diastole, the rate after the preliminary slowing remaining unchanged until the end. It is worthy of note that in the case of intravenous injections the fall of temperature, which is so marked a feature after the intraperitoneal and subcutaneous injections of the poison, does not occur. The explanation of this fact is doubtless to be found in the very short interval of time which elapses between the injection and a fatal outcome. As regards the size of the lethal dose when given intravenously, we see that 10 milligrams often, and 15 milligrams invariably, proved fatal.

For purposes of comparison, we have always made use of the poison obtained from the same extraction in our intravenous, subcutaneous and intraperitoneal injections and have therefore been able to ascertain with a fair degree of accuracy the differences in dose required to bring about a fatal result in the three cases. Thus, whereas 60 mgs. represents the fatal dose when given intraperitoneally, it requires between 120 and 180 mgs. subcutaneously and only from 10 to 15 mgs. of the same poison to cause death when given intravenously. These differences are undoubtedly due to the rapidity of absorption in the various cases, and a fatal issue depends entirely on whether sufficient poison reaches the respiratory center at one time to cause cessation of respiration or not.

It has now been shown that a very powerful intracellular poison can be obtained from the colon bacillus. As has been previously stated, the results given in the foregoing experiments are those obtained with the poison from one extraction only. It must be understood that the poison is not in a pure state and when it is stated that 60 mgs. causes death when injected intraperitoneally we refer simply to the powder obtained from a given extraction. We have been able to procure powders which kill in doses of 15 and even as low as 8 milligrams when given intraperitoneally. This difference is in large amount due to the presence of sodium chlorid, since no attempt has been made to remove this salt in the case of the less toxic powders by redissolving in absolute alcohol.

There are several facts which lead us to believe

that this poison is the one which causes the symptoms of illness and death in animals infected with the colon germ. Most of these facts have already been brought out, but it may not be out of place to briefly recapitulate at this point. As has been previously seen, the results obtained with the living germ, the dead bacterial substance and the soluble poison can best be explained on the ground that the toxic body in each case is the same. The differences in action are not differences in symptoms but simply in the rapidity with which these symptoms become manifest. While it is undoubtedly true that in animals dying with the minimum fatal dose of the living germ, the convulsive stage is not present or is only slightly marked, it is rarely absent in cases where from three to four times the fatal amount has been given. The sole difference between the living germ and the soluble poison which would appear to demand an explanation is the lack of evidence of a peritonitis in the latter case. This, we think, is best explained by the fact that in the case of the soluble poison the toxic substance exists in an uncombined form, which, of course, is not true in the case of either the living or the dead bacterial cell. The uncombined poison is rapidly absorbed from the peritoneal cavity and hence the irritative effects which would result from its retention in this place are absent.

As has been stated, one of the first signs of the action of the poison is a lowering of the body temperature. This hypothermia is usually present to a marked degree and is noticeable before any visible symptoms occur. It is therefore, the best index which we have as to the exact time at which the poison begins to exert its effect. In the same manner, the rise of temperature after the development of hypothermia is the first indication of recovery. Moreover, if in an animal with a subnormal temperature a rise occurs, it is an infallible sign of ultimate recovery, no matter how grave the general condition may appear to be at the time. We have laid great stress, therefore, on the changes in body temperature as furnishing the most delicate test of the action of the poison. It may be here stated that the body temperature of guinea-pigs is ordinarily fairly constant within certain narrow limits, and they are much more satisfactory animals to work with in this respect than are rabbits. Moreover, their temperature does not seem to be materially altered by the injections of sterile salt solution or of such inert substances as a suspension of pumice stone into the peritoneal cavity. As has been seen in the case of the living germ, it is only after the lapse of several hours that a fall in temperature occurs. This would indicate that it it is not until this time that sufficient poison is liberated to cause noticeable toxic effects in the animal. That it takes an appreciable time for the poison to be liberated from the bodies of the bacilli is well illustrated in the instance of the dead bacterial substance. Here it is only a question of dissolution of the bacilli and the setting free of the contained poison, and yet it will be noticed that an interval of at least two hours and usually longer elapses before there is any noticeable fall in temperature. The maximum effect in this case is reached between four and six hours, and if the dose has been a non-fatal one, recovery begins at the end of from eight to ten hours, as is indicated by the upward trend of the temperature curve at this point. In the case of the soluble poison, the toxic effect begins at once. Within fifteen minutes the temperature has begun to drop and within an hour has reached a minimum. Recovery then begins and within three hours the effect of the poison has worn off, as is best evidenced by the return of the body temperature to normal or above at this point.

As has been previously mentioned, it is not the purpose of this paper to prove that this poison is a true toxin; such proof can be established only by the demonstration of the production of an antitoxin. It is our intention to treat of this subject in a later paper. Again, it is not claimed as yet that the intracellular poison of the colon bacillus is specific in the sense that similar poisons can not be obtained from other sources. A comparison between the poison of the colon bacillus and certain poisons obtained from other proteid substances will form the basis of a subsequent paper.

Finally, as has been shown in the paper of Dr. Wheeler, this poison can be obtained from the colon germ when the latter is grown on a medium which contains no proteids. This would seem to indicate conclusively that the colon germ is able to build up its poison synthetically, since the latter is unquestionably a proteid body.

CONCLUSIONS.

The conclusions which we have drawn from the above data may be summarized as follows:

1. The colon bacillus produces a powerful poison when grown on artificial media.
2. This poison is intracellular in character, and is contained within both the living and the dead bacterial cell.
3. The poison can be separated from the other constituents of the bacterial cell only by means which chemically break up the latter.
4. The peritonitis which occurs after intraperitoneal inoculation with the colon bacillus is due to the presence of the poison in a combined and not in a free state.
5. The intracellular poison of the colon bacillus causes a marked fall in the body temperature.
6. The poison of the colon bacillus apparently causes death by paralysis of respiration.
7. The intracellular poison is an essential group of the bacillus, and can be built up synthetically on proteid-free media.
8. This intracellular poison is the poison which causes death in animals inoculated with cultures of the living colon bacillus.

THE DIAGNOSIS OF SYPHILOMA OF KIDNEYS.*

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CHICAGO.

It will not be possible to consider all the syphilitic diseases of the kidney in the few minutes allotted to this subject. There can be no question that syphilis as an etiologic factor must be seriously taken into the consideration of the inflammatory kidney diseases. That syphilitic nephritis exists, however, is doubted by some of the best authorities, it being classed with nephritis, and syphilis is considered only as an etiologic factor. I do not wish to insist that a syphilitic treatment should be instituted in such cases; in fact, authorities differ; some advise strongly against the use of mercury in these conditions. It certainly

* Read before a joint meeting of Chicago Urological and Chicago Medical societies.

seems, however, that if it be a syphilitic process it should be treated as such. Neither do I wish to discuss whether or not amyloid kidneys are based on syphilis as an etiologic factor.

Virchow, in 1858, first reviewed the subject of syphilitic changes in the kidneys. It might be said that what he stated at that time is looked on to-day practically in the same manner. Beer, in 1858, was the first to report a typical case of gummata of the kidney. It was not until 1867 that his work on kidney syphilis appeared. These two works, in addition to Lancereaux's, which appeared in 1866, were the pioneers in this field of work, and we still consider them our standards. Seiler studied syphilitic gummata clinically as early as 1881. Numerous writers have taken this subject (gumma) into consideration, but much more literature can be found on the so-called syphilitic albuminurias.

Undoubtedly, it is syphiloma of the kidney which is of especial interest to the surgeon, and, as I have been asked to take up this topic, I have only mentioned the other forms of syphilitic kidney disease.

These gummatous manifestations of syphilis must naturally fall into the class of late syphilitic manifestations. If infection should have occurred in childhood, such manifestations could appear in early life. Middle life, however, is the time when such cases are most often expected. These facts are demonstrated by the statistics of Karvonen. This holds true, one might say, of all visceral (gummata) affections. In taking this condition into consideration, it is wise to disregard a negative history, which can never be taken as proof that the patient has never had syphilis, for there are certainly many instances in which the patient has not been made aware of his infection.

In individuals who have had syphilis and who have lacked treatment altogether, or have had but insufficient treatment, syphiloma of the kidney must always be taken into consideration in the differentiation of obscure kidney troubles. These affections may be concomitant with other forms of kidney diseases, and it must not be forgotten that only one kidney is usually involved in a gummatous process.

In the diagnosis, it is desirable to note the presence of or previous evidence of any gummatous manifestations elsewhere. It is essential to eliminate in the diagnosis all symptoms which may be caused by a simultaneous nephritis. In doing this, it has been practically established that up to the present time no typical clinical array of symptoms exists on which we can base a diagnosis of gumma of the kidney. Considering the pathologic anatomy, this readily can be understood. Lancereaux pointed out that scarcely any urine is secreted by that portion of the kidney involved in the gummatous process, and hence the clinical findings in the urine are not typical. Leucocytes and casts occasionally can be found microscopically, and the appearance of albumin is not unusual. These findings have been noticed to be intermittent. Cohnheim states that numerous miliary gummata may cause symptoms similar to those of an interstitial nephritis.

Finally, if syphilitic scars set in, they produce a severe atrophy of the kidney, and cause symptoms similar to those found in a severe grade of contracted kidneys. Such could be the course of the disease, but a kidney has never been demonstrated which shows all these different steps.

In case a gumma ruptures and the contents empty into the pelvis of the kidney, and finally into the bladder, would it be possible to make a probable diagnosis? In such cases, no general symptoms need accompany the passing of a dirty brownish-colored urine containing débris. No fever, no chills, no particular symptoms and no pain need follow such a rupture of a gumma. A cystoscopic examination and segregation or catheterization may collect the urine separately, and the functional capacity of each kidney may be looked into. In such a case, the capacity need not be greatly impaired. If, however, the kidney substance should be studied with miliary gummata, undoubtedly the sufficiency would be greatly influenced.

I might add that in such a case the microscopic examination might show red blood corpuscles, degenerated cells and detritus. As already stated, a concomitant nephritis might be present, and if so, the usual findings, both microscopic and chemical, would be expected.

After such a cavity empties itself, the course may be variable; the appearance of the above-mentioned microscopic findings with a trace of albumin may gradually or suddenly disappear, and if no nephritis coexists, one might not find even a trace of any pathologic product in the urine. As no symptoms need have been present, the whole trouble might pass over without any further untoward signs or symptoms. If other gummata are present, similar attacks may reoccur. The interval of breaking down may be short, or a long time may elapse before such another occurrence.

Undoubtedly, an interstitial nephritis might be expected in cases of repeated gummatous rupture. The symptoms of a gumma may be overlooked, especially if a diffuse nephritis or amyloid degenerative process coexists.

It is the object of this paper to point out the possibility of gumma of the kidneys, especially when dealing with "surgical kidneys," and where the amount of blood and débris is large or small, which would cause us to consider surgical interference.

The rôle played by the minute examinations, such as injection of indigo carmine, the production of artificial glycosuria inhibition of methylene blue, etc., can only be surmised, as I know of no case up to the present in which such findings are reported.

In establishing the diagnosis of syphiloma of the kidney, it must be remembered that if the gumma or gummata are of large size, the kidney with these irregularities may be palpated. There may be cachexia present, the patient may naturally have lost in weight. With all these signs and symptoms, it becomes necessary to differentiate from a malignant growth. The indolent character and the benign course of such a tumor, however, always speak for a luetic cause.

Wherever these findings are present, a nephrectomy must not be done until the possibility of syphilis has been excluded.

414 Marquette Building.

Business Hints.—There is little chance of accumulating money from the practice of medicine. A small competence can be saved by diligence, frugality, and good management. The saving must be done between the ages of thirty and fifty. He should protect his family with adequate life insurance. He should never be foolish enough to speculate, but should stick closely to his own business. Accumulations of a lifetime have often been swept away in the foolish hope of large speculative returns.—N. H. Adams.

THE PATHOGENESIS AND TREATMENT OF GOUT.*

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SAN FRANCISCO.

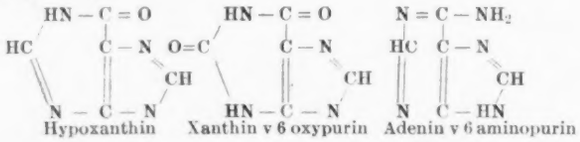
Since the classical investigations of Garrod we know that gout is characterized by the presence of uric acid in the serum and that the gouty attacks are caused by the precipitation of this acid into the joints. Every theory of gout must explain these characteristic features, and every pathogenic conception of the disease is based on these facts.

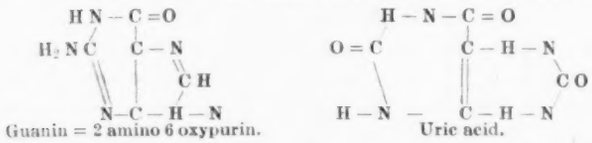
Before we enter the discussion of the different theories which attempt to explain the pathogenesis of gout, I should like to give a short review of the formation of uric acid in physiologic conditions. While till about ten years ago uric acid was considered to be a product of imperfect oxidation of albuminous bodies, it has been proved since that uric acid has nothing whatever to do with albumin, but must be looked on as a specific oxidation product of the purin bodies derived either from the nucleic acid of the food or from the breaking down of the cell nuclei in the catabolism.

The nitrogenous bodies which are oxidized in metabolism belong to three categories: 1, Albumin; 2, paranuclein; 3, nuclein. Of these three only the nucleins are able to form uric acid in the following manner:

Nuclein
Albumin Nucleic acid
Thymic acid Purin bases.

The purin bases consist of xanthin, hypoxanthin, guanin and adenin.





Uric acid is formed by oxidation of those purin bodies; only when they are present can uric acid be found. The purin bodies may be ingested in the food and form what is called the exogenous part, or may be available for oxidation by the catabolism of the tissues and so form the endogenous part of the uric-acid excretion. The normal uric-acid excretion consists of about 0.2 to 0.3 gr. of endogenous uric acid, and of about 0.2 to 0.4 gr. exogenous. So nearly half of the uric-acid excretion is the result of tissue catabolism.

Such is the origin of the uric acid, which plays so important a rôle in the pathogenesis of gout by its presence in the serum and by the precipitation thereof into the tissues.

There have been several theories put forward to explain these two facts and they may be divided into two groups. The first one considers a retention of uric acid the cause of its presence in the serum, and of its precipitation into the tissues; the second considers the cause an increased production of uric acid.

The first of these theories was the one proposed by Garrod; his views may be summed up as follows: The formation of uric acid in gout varies within normal limits, but it is retained in the body owing to the inability of the kidneys to excrete the formed uric acid. This inability is mostly due to anatomic lesions, in some cases to functional changes in the kidneys. The retention is more marked at certain periods, during which the excretion is sometimes entirely stopped. In those cases the blood contains an amount of uric acid so great that it is unable to hold it in solution. Therefore, the blood gets rid of its excess of uric acid by a vicarious excretion into the joints.

The work of Garrod was based on the estimations made by the method of Heintze, which was proved later to lead to erroneous results.

Repeated investigations of metabolism in gout, by the method of Ludwig-Salkowski, the only one which allows an accurate estimation of uric acid, have shown that the results of Garrod could not be confirmed; while in some cases the uric-acid excretion is below normal or normal, it has been shown that there are cases of gout in which the uric-acid excretion exceeds the amount which is considered to be normal. To account for that, a view different from Garrod's was put forward. It explained the presence of uric acid in the serum and its precipitation into the joints by an increased production.

Neither of these explanations can be accepted for the following reasons: If one increases the formation of uric acid in a gouty patient by giving thymus gland in large amounts, the surplus of uric acid, the excretion of which can even attain 2 gr. in 24 hours, is eliminated by the kidneys without showing any difference from normal conditions. This experiment, which has been often repeated and confirmed since it was first published by me about ten years ago, shows that neither a retention nor an increased production can explain the symptoms of gout; a retention can not take place, because the kidneys are able to excrete a much larger amount than is formed in normal conditions; an increased production on the other hand, all other conditions being identical, could have but one result, an increased secretion.

Since these two theories fail to account for the features of gout, it is evident that their explanation can not be found by quantitative changes, and we must therefore look for the solution by qualitative changes. A close study of the physiologic excretion of uric acid will show in what direction those qualitative changes may be found. We have seen that in normal conditions uric acid is only formed by oxidation of the purin bases, and that at the same time as a result of the same process thymic acid is formed. Now it has been shown by Kossel and Minkowski that the uric acid is able to form a compound with thymic acid. The compound thus formed shows the peculiarity that the uric acid can not be detected by any of our reactions for it. It disappears completely for our methods of investigations and can not be precipitated.

There can be little doubt that in physiologic conditions this compound of thymic and uric acid is the form in which the uric acid circulates through the body and the blood. It accounts for one fact, otherwise unexplained, that we can not find any uric acid in normal blood, although we know that it must be present there, because it is not formed in the kidneys, only excreted. Therefore the morbid feature in gout is not the presence of uric acid in the blood, but its precipitability. Normal blood also contains uric acid, but we can not detect it, because it is combined with thymic acid; gouty blood

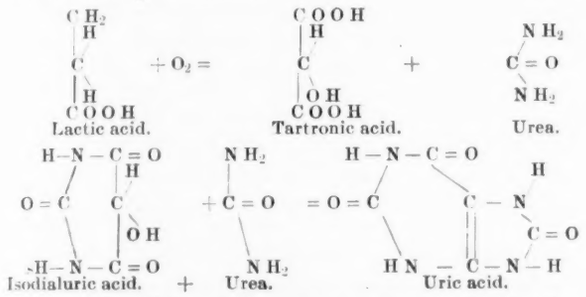
* Read before the San Francisco County Medical Society.

may contain an amount not exceeding the normal, but it is precipitable and we therefore conclude not combined with thymic acid.

Hence the answer to the question why the uric acid is not combined with thymic acid we believe will clear up certain points in the pathogenesis of gout.

There are two possibilities: The first is that the uric acid is formed normally, that is by oxidation of the purin bases, but is for some reason not combined with thymic acid.

The second possibility is that the uric acid is formed synthetically and not by oxidation. We know that the largest part of the uric acid is formed synthetically in the avian organism, as has been shown by Minkowski and Wiener. On the other hand, we know that during infancy the human organism can synthesize the purin ring, and that even the adult body is able to form the same synthesis, I have shown in a paper in the Johns Hopkins Bulletin.[1] This formation can be shown by the following formulas:



The possibility of a synthesis of uric acid in the human organism is therefore to be granted.

To decide which possibility is realized in the gouty organism I had to make two series of experiments.

1. I had to prove that the uric acid has not lost its ability to form a compound with thymic acid.

To do this I fed several gouty patients with thymic acid and have been able to demonstrate that the output of uric acid is much increased during the medication with thymic acid. Therefore the uric acid combines with thymic acid and regains the physiologic conditions under which it is excreted in normal metabolism.

One could object to this experiment that the increase of uric acid is not due to an increased excretion of the uric acid already performed in the blood, but to an increased formation caused by the pyrimidin group in the thymic acid. Therefore I have checked my experiments in feeding a normal man with thymic acid, and in this case I have not obtained any increased output of uric acid. It shows that the increase in the output of uric acid caused by thymic acid in the gouty organism is due to an increased excretion of already present uric acid, not to increased formation.

2. The second point which I had to prove was the synthetic formation of uric acid in the gouty metabolism. I increased in a gouty patient the amount of paranucleins in the food and obtained a very marked increase in the uric acid output (0.15 0.45 gr). In the case of a normal man this experiment would not have influenced the uric acid, because the paranucleins do not contain any purin bases; it proves that the uric acid was formed synthetically.

Those experiments lead to the following conception of gout:

In gout the uric acid is not only produced by oxidation of purin bases, but also by synthesis; this synthesized uric acid, therefore, has not at its disposal the thymic acid necessary for its solution. It is the reason why we can detect uric acid in the serum. If the formation of the synthetic uric acid increases for one reason or another, there follows a saturation of the serum with this kind of uric acid, and as no thymic acid prevents it from precipitation it is deposited in the joints as tophi.

I believe that this view explains most of the features in gouty metabolism, but there are still some difficulties which have to be accounted for.

The principal one is the precipitability of uric acid in the serum in some other diseases, as in pneumonia, etc., and after administration of thymus. But all those cases can be explained by the fact that the molecule of the moleic acid, obtained either from the tissues or the food is split before the formation of uric acid, and that therefore the thymic acid can not form its compound with uric acid, because it is not present when uric acid is formed.

We know that in pneumonia the presence of uric acid follows the resorption of the exudate in the lungs, which takes place by autolysis of the inflammatory products demonstrated by Müller. By the autolytic process, however, the nucleic acid is split up into purin bases and the decomposition products of thymic acid. Therefore the uric acid formed by oxidation of the free purin bases has no thymic acid at its disposal with which to combine.

The same explanation can be applied to the uric acid after administration of thymus. We know that thymus contains a large amount of uncombined purin bases; by cooking a still larger amount is set free; those free purin bases resorbed without the complementary thymic acid yield precipitable uric acid.

The precipitation of uric acid in the case of nephritis may be explained in the following way:

The compound of uric acid and thymic acid is split up in the kidneys; it is shown by the precipitability of uric acid in the urine. It becomes free in the kidneys, but can not be excreted by the diseased epithelial cells, and is so returned into the circulation, where it becomes accessible to the precipitation by acids.

Our view of the formation of the uric acid explains also some very old observation, which offered some difficulties. It is the fact that meat in large quantities, and especially gamey meat, produces gouty attacks. Meat contains about 2 per cent. of free hypoxanthin which, having no thymic acid at its disposal, behaves like synthetically-formed uric acid. On the other hand, the gamey meat contains by the autolytic process which it has undergone, and which splits up the nucleins, a still larger amount of free purin bases.

Thus this old observation, which is recorded by every writer on gout, finds a rational explanation.

It was quite natural to apply the views resulting from our experiments to the treatment of gout. I have given the thymic acid to about 30 cases of gout, and have been able to observe some of them for several months. In about nine cases I have estimated the excretion of uric acid during the medication. I will not go into the details of the histories, but give a short résumé of the observations. As we have seen before, the excretion of uric acid is constantly increased during the medication. The increase varies between .17 and .42 gr. for 24 hours, amounting to from 15 to 45 per cent. of the daily excretion. This increase lasts for about ten days, and returns then slowly to the former amount. It can be easily explained by the fact that after the uric

1. E. Schmoll: The Chemical Origin of Leucocytes, Johns Hopkins Hospital Bulletin, July-August, 1904, p. 238.

acid accumulated in circulating form is excreted, the daily amount of synthetically formed uric acid is too small to be demonstrated by our analytical methods. The patients felt very well during the medication, and I have never seen any gouty attack occur during the medication or for some time after the medication was stopped. The movement in the diseased joints became easier and in several cases the swelling of the joints lessened, and in two cases disappeared entirely.

I have only once had the opportunity of treating an acute gouty attack, with the results that the swelling of the great toe, and the elbow, in which two articulations the attack was localized, disappeared entirely within 6 hours. In the other cases, in which the swelling of the joints was due to deposits and tophi in the articulations, the thymic acid seemed to be without any effect on the enlarging. It can not be expected that the thymic acid should dissolve deposits, because it does not dissolve the uric acid, but prevents it from precipitation, and therefore prevents further attacks.

The dose of thymic acid to be given is about .25 gr. from 3 to 4 times a day. When I started my experiments, I gave doses of 3 or 4 grams in 24 hours, but observed in three cases that a local reaction followed the ingestion of that amount. Wherever uric acid was present a local inflammation started, which lasted for about 48 hours. In giving the aforementioned doses I never saw any local reaction following the medication. I observed in some few cases gastric disturbance, as a secondary effect on the organism; it can be easily avoided by giving the thymic acid after meals. The action of the heart or the kidneys was never interfered with, although special attention was paid to those two organs.

In closing, I should like to insist on the fact that this theory explains only two symptoms of the gouty metabolism; the precipitability of the uric acid in the serum and the uric acid deposits in the joints. It stands to reason that those two phenomena are only the result of a primary disturbance in the metabolism, the character of which we are unable to explain, but which shows its presence by the synthetic formation of the uric acid. For the same reason, the medication by the thymic acid would only be able to neutralize the effects of this primary disturbance, but does not pretend to cure gout.

THE INTERCOMMUNICABILITY OF HUMAN AND BOVINE TUBERCULOSIS.*

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Prior to Professor Koch's[1] memorable address in 1901 a considerable amount of evidence had accumulated which seemed to indicate that the human and the bovine tubercle bacillus were not identical and that the former was incapable of causing a generalized tuberculosis in cattle. Not only had the earlier work of Bollinger,[2] Chaveau, Günther and Harms, and others shown that the feeding of calves, swine and goats with human tuberculous material was unattended by ill effects in these animals, but, in more recent times, a number of experiments had been reported in which attempts to infect cattle with human tubercle bacilli were followed by absolutely negative results.

Baumgarten,[3] who in 1891 sought to determine the identity of human tuberculosis and *Perlsucht*, failed to produce the slightest trace of tuberculosis in a calf which he inoculated with human tubercle bacilli, whereas the control calf which was infected with bovine tubercle bacilli died at the end of six weeks of acute general miliary tuberculosis.

Later Gaiser[4] inoculated a calf, into the eye and also subcutaneously, with human tubercle bacilli; but the irritation of the eye infection, which was decided at first, soon diminished, and after three weeks the cornea had become again entirely clear and transparent. At autopsy, three months after infection, no tuberculosis was found, although the control animals, a rabbit and a guinea-pig, died five and a half months after inoculation, showing that the infecting material was virulent. In this country Frothingham[5] inoculated intraperitoneally two calves with a culture of human tubercle bacilli from the liver of a child. In both only slight local changes were produced. Of two other calves inoculated into the trachea, in one there occurred a local abscess in the muscles of the neck, with a few minute tubercles devoid of tubercle bacilli in the liver and in the lungs, while in the other no lesions whatever were to be found. Thus only local effects were induced. Dinwiddie[6] made similar experiments with like results, and finally Theobald Smith,[7] in an extensive comparative study of bovine tubercle bacilli and of human tubercle bacilli from sputum, demonstrated very clearly the restricted character and the lack of all tendency toward progressive disease of the lesions produced in cattle by bacilli of human origin.

While the results of experimental work up to the time of Koch's communication at the London congress indicated that human tuberculosis was not transmissible to cattle, the circumstantial evidence of clinical experience seemed to show that pearl disease constituted a grave danger to man, and, therefore, the medical profession as a whole very properly continued to urge the general adoption of stringent prophylactic measures against infection through the milk and meat of tuberculous animals. In this connection it should be remarked that Koch did not absolutely deny the possibility of human infection from bovine sources, but stated that from the results of the experiments carried out with Professor Schütz of the Veterinary College in Berlin, he felt justified in maintaining that human tuberculosis differs from bovine and can not be transmitted to cattle. This fact was abundantly evident from the pathologic specimens exhibited in London and of which Virchow[8] said: "The infections with human tubercle bacilli of the experiment animals have produced no lesions whatsoever which can be compared with bovine tuberculosis." On the other hand, regarding the question of infection of human beings with bacilli of bovine origin, in the light of the infrequency of the occurrence of primary intestinal tuberculosis in man, Koch reasoned by analogy that the bovine tubercle bacillus bears the same relation to human tuberculosis that the human tubercle bacillus does to bovine tuberculosis.

For the further investigation of the subject Koch

* Read before the Buncombe County Medical Society at Asheville, N. C., 1904.

1. Koch, R.: Deut. med. Wochft., vol. xxvii, 1901, No. 33, p. 549.
2. Bollinger: Arch. f. exper. Path. u. Pharm., vol. i, 1873, p. 356.
3. Baumgarten: Jour. of Tuberculosis, vol. v, 1903, No. 1, p. 1.
4. Gaiser: Inaug. Diss., Tübingen, 1893.
5. Frothingham: Report of Mass. Cattle Commission for 1897.
6. Dinwiddie, R.: THE JOURNAL A. M. A., vol. xxxix, 1902, No. 25, p. 1574.
7. Smith, Theobald: Jour. of Exper. Med., vol. iii, 1898, p. 451.
8. Virchow: Berl. klin. Wochft., vol. xxviii, 1901, No. 31, p. 818.

himself suggested the study of cases of primary intestinal tuberculosis and the isolation of the tubercle bacilli from the lesions in such cases, as an aid in the determination of the question, inasmuch as if the tubercle bacilli thus obtained had a bovine origin this would be shown by their characteristic behavior on artificial culture, as well as by their pathologic effect on cattle. His own experience, however, as also the rarity of the findings of primary intestinal tuberculosis in various pathologic institutes in Germany, warranted him in the statement that the frequency of human infection from bovine sources was probably not greater than that of congenital tuberculosis, and that, therefore, preventive measures against bovine tuberculosis were not necessary in the degree then considered essential, since the simple boiling of the milk would protect infants in whom cow's milk was substituted for that of the mother, whereas prophylaxis against human tuberculosis was still greatly inadequate and in this direction the chief effort should be made.

Koch did not consider the question entirely closed, however, and it was through his instrumentality that more extensive experiments were undertaken at the Imperial Health Bureau. From the time of the organization of a special commission for this purpose until last spring, when the commission made report, a great number of experiments were performed, chiefly to determine the relation of human tuberculosis to that of cattle. During this time cases of primary intestinal tuberculosis were carefully sought for and, also at the instance of Koch, the pathologic institutes in Prussia were requested to report every case found.

During the past three years a large number of experiments have been reported by numerous investigators, the majority of whom claim positive results in the transmission of human tuberculosis to cattle. As a whole this work is more or less subject to just criticism, and there is scarcely one of these experiments in which there have not been possible sources of error. Before examining the evidence, however, let us look back to the experimental investigations of Villémin's time when so much confusion was rife as to the infectious nature of tubercle.

By the inoculation of animals with tuberculous material which had presumably been rendered innocuous before introduction, also with non-tuberculous material from cadavers and even with all sorts of indifferent substances, the contemporaries of Villémin caused lesions which in minute detail simulated true tuberculosis.

For example, by inoculation in the necks of experiment animals of tubercle and of material from caseous lymph glands which had been soaked for months in alcohol and had in addition been boiled immediately before inoculation, Waldenberg[9] succeeded in producing miliary gray nodules in the internal organs. Experimental inoculations made by Wilson Fox[10] in 117 guinea-pigs and in 12 rabbits in which non-tuberculous substances were introduced subcutaneously, produced not only pseudotuberculous lesions locally and in the neighboring lymph glands, but also in multiple internal organs. Panum[11] in studying embolism noted in the course of his experiments that when he introduced foreign substances (metallic mercury, wax globules, and even air) into the vessels of animals, minute foci occurred with great regularity which were apparently analogous with miliary tubercles. Like results were obtained by Lebert and Wyss[12] by the intravenous injection of coal dust and quicksilver. Again Cohnheim and Fraenkel[13] injected into the jugular vein of guinea-pigs fresh blood of another healthy guinea-pig with the production of typical miliary pseudotuberculosis of the lungs and liver. Likewise, these same authors introduced into the peritoneal cavity of guinea-pigs bits of filter paper, lint, guttapercha, raw and vulcanized rubber. Some of the animals died soon of general peritonitis, but others gradually became emaciated and died, and in these autopsy showed disseminated pseudotuberculous lesions of the peritoneum, liver and lungs. In more recent years it has been shown by Prudden and Hodenpyl[14] and others that dead tubercle bacilli, when introduced into the serous cavities or injected intravenously in animals, are capable of producing histologic tubercle.

In the light of these and of numerous other similar experiments which were performed prior to the discovery of the tubercle bacillus, some of the sources of error in the attempts which have recently been made artificially to transmit human tuberculosis to cattle become at once apparent.

Such evidence Baumgarten[3] had in mind when he pointed out at the International Tuberculosis Conference in Berlin that all the experiments which had been made up to that time had been performed in an objectionable manner. As Baumgarten there insisted, inoculations should not be made otherwise than subcutaneously, and the number of tubercle bacilli introduced must not be too large, for only thus can it be shown whether a tuberculous infection takes root at the point of inoculation and extends therefrom within the organism through the lymphatics and the blood stream. For this purpose intravenous injections are useless, because, even with dead tubercle bacilli, a disease can be produced similar to tuberculosis and which can result fatally, not because of the existence of true infectious tuberculosis, but on account of embolism due to foreign bodies which in this instance would be tubercle bacilli. Experience having shown that by the intraperitoneal application of dead tubercle bacilli, and even of indifferent substances, an affection simulating true tuberculosis can be engendered on the peritoneum, it follows that intraperitoneal infection must be avoided.

Keeping in mind the possible sources of error as indicated above, we may now proceed to examine the evidence which has recently been brought forward for the purpose of disproving Koch's proposition.

The following experiment is that of Professor Orth:[15] A piece of tuberculous kidney of a rabbit, which had been infected with a pure culture of tubercle bacilli obtained from a human phthisical subject, was placed in the peritoneal cavity of a calf. Twenty-six days after inoculation the calf died of general tuberculous peritonitis. At autopsy the peritoneal serosa was covered with miliary and submiliary gray nodules; the great omentum, the intestinal serosa and the parietal layer of the peritoneum were studded with miliary nodules and there was marked swelling of the mesenteric, portal and cardiac lymph glands. In addition there was an enlarged gland at the left knee joint and the left shoulder gland was swollen but of these glands the author says that the

9. Waldenberg: Die Tuberculose, die Lungenschwindsucht und Scrofulose, Berlin, 1869.
10. Fox, Wilson: The Artificial Production of Tubercle in the Lower Animals, London. 1868.
11. Panum: Virchow's Arch., vol. xxv, 1862, pp. 308-433.
12. Lebert and Wyss: Virchow's Arch., vol. xl, 1867, pp. 142-551.
13. Cohnheim and Fraenkel: Virchow's Arch., vol. xlv, p. 216.
14. Prudden and Hodenpyl: New York Med. Jour., June 6 and June 20, 1891.
15. Orth: Berl. kl'n. Wochft., vol. xxxix, 1902, No. 34, p. 793.

evidence of tuberculosis was uncertain. The other organs were free from tuberculous changes. Microscopic examination of the peritoneal nodes and of the various glands showed tuberculous granulation tissue containing giant cells.

From the result of this experiment Orth insists that he has produced not only a local but a progressive tuberculosis in the calf and that human tuberculosis is transmissible to cattle. The objection to intraperitoneal infection has been stated above, and that Orth has produced nothing more than could have been produced by the introduction of dead tubercle bacilli or of indifferent foreign substances there can be no doubt, as is shown by the experiments which have been cited, and in which lesions were produced in the experiment animals not only of the peritoneum, but of the liver and lungs as well.

Positive results in the transmission of human tuberculosis to cattle are also claimed by Fibiger and Jensen.[16] In three of their experiments in which the material used for inoculation originated from cases of apparent primary intestinal tuberculosis, calves were infected intraperitoneally. The results in these instances, therefore, need not be further considered. In two other cases the subcutaneous method was employed and these will be discussed in their proper place. Intraperitoneal infections have been made also by Ravenel,[17] Crookshank,[18] de Schweinitz, Dorset and Schroeder,[19] and others, with supposed positive results. These experiments are of course subject to the same criticism as that of Orth.

The following experiment of Ravenel[17] is of especial interest since it illustrates so perfectly the objection to the intravenous method of inoculation: From a child in which the evidence of primary intestinal tuberculosis seemed clear guinea-pigs were inoculated intraperitoneally with an emulsion of the mesenteric glands. From one of the guinea-pigs a culture was made and a suspension of 5 c.c. of the fifth and sixth generation of this culture was injected into the right jugular vein of a calf which had not responded to a tuberculin test. On the next day the temperature had risen to 103.2 F.; after a slight remission it rose to 103 F. on the seventh day after inoculation and continued to rise each day, reaching 106.4 F., after which it fell slightly until death, which occurred on the seventeenth day. Ravenel further stated that the animal showed marked illness during life, the respiration reaching 68 a minute.

At autopsy both lungs were thickly studded throughout, with remarkable uniformity, as Ravenel says, with miliary nodules. The left lung was pneumonic owing to the position of the calf for some time before death. The bronchial and mediastinal glands were much enlarged and soft. The liver showed several nodules on the surface, the spleen showed slight changes and the kidneys were normal.

No argument is needed to show that this calf succumbed to an embolic affection, a result which could have followed just as certainly had entirely indifferent substances been employed instead of the culture.[20]

A third experiment made by Ravenel in which a grown cow succumbed on the seventeenth day after receiving 5 c.c. of a suspension of this same culture, 2.5 c.c. intravenously and 2.5 c.c. intraperitoneally, is doubly objectionable and needs no further comment.

The intravenous method was also employed by Arloing,[21] and in one of their experiments by de Schweinitz, Dorset and Schroeder.[19]

Among the experiments in which the successful transmission of human tuberculosis to cattle is alleged, subcutaneous inoculation has been the mode of infection in but a few instances.

Fibiger and Jensen[16] have communicated the following case: A four-months-old boy, who had been artificially fed after the age of five weeks, succumbed to tuberculous enteritis. At autopsy, most extensive ulcerations were found in the intestinal tract; the largest, in the ileum, penetrated to the muscularis and extended transversely nearly one-half the circumference of the bowel. There were two other similar ulcers higher up. The vermiform appendix was also ulcerated and the entire colon from the valve of Bauhin into the rectum presented sharply circumscribed ulcers. The mesenteric glands were caseous, and numerous miliary tubercles were present throughout both lungs.

By rubbing up a caseous mesenteric gland from this case, in normal salt solution a turbid fluid was prepared which contained comparatively few tubercle bacilli, but other germs. Of this fluid a "few" c.c. were injected into the neck of two young calves. Both these animals died of a putrid embolic affection of the lungs. A third calf which was injected into the neck with material from one of the former died several weeks later. The postmortem showed at the point of inoculation a large tumor of fibrous tissue containing many caseous nodules and a large excavation filled with necrotic, caseous, purulent and disintegrated, foul-smelling tissue. The neighboring glands were enlarged and also the middle and deep cervical. The pleura and pericardium presented fine, red connective tissue formations. The lungs contained innumerable small nodules. There were further caseous processes of the bronchial and mediastinal glands, isolated caseous nodules in the myocardium and scattered tubercles in the liver, spleen and kidneys, etc.

I can not agree with the authors that in their work Koch's propositions have found their refutation. They have themselves shown that the two calves first infected died of putrid pulmonary embolism. It is to be regretted that no statement as to the exact amount of fluid injected appears, but the results in these animals are more than suggestive that in making the subcutaneous injections an unintentional introduction of some of the material into a vein occurred. The very generally distributed small nodules in the lungs of the third calf, and the dissemination of lesions practically throughout the whole organism, awaken the suspicion at least that such an accident happened in this instance also.

Furthermore, the presence of other pathogenic bacteria in the material used for infection renders the experiment additionally questionable, for how much these may have contributed to the effects produced is a matter of conjecture. But above and beyond these sources of error the experiment is incomplete. The tubercle bacilli should have been isolated from the dead animals, their cultural and morphologic characteristics should have been identified and their degree of path-

16. Fibiger and Jensen: Berlin klin. Wochft., vol. xxxix, 1902, No. 38, p. 881.
17. Ravenel: Univ. of Pa. Med. Bulletin, May, 1902.
18. Crookshank: The Lancet, London, vol. II, Nov. 2, 1901, p. 1176.
19. De Schweinitz, Dorset and Schroeder: Amer. Med., vol. iv, 1902, No. 22, p. 850.
20. Compare the experiences of Panum, Cohnheim and Fraenkel, and Lebert and Wyss, which have been referred to in the preceding pages of this paper.
21. Arloing: Cited by Baumgarten.

ogenicity should have been demonstrated by infection of other cattle, in order to determine whether or not the tuberculosis in the child had in the first instance a bovine origin. This, unfortunately, Fibiger and Jensen failed to do, and the experiment in consequence has no value as evidence on either side of the question.

The subcutaneous method of infection was resorted to in one instance by de Schweinitz, Dorset and Schroeder.[19] They inoculated a heifer back of both shoulders, respectively, with a piece of the lung and a piece of the intestine of a child dead of generalized tuberculosis. Autopsy six months later showed at the seat of inoculation small multiple abscesses in the skin. The regional glands were enlarged and contained many necrotic foci. On the pleura of the lung numerous pale red excrescences were found and similar growths were sprinkled over the diaphragm. The authors claim a positive result in this case, but, inasmuch as only local non-progressive changes were produced the experiment rather confirms Koch's views than otherwise.

The positive experiment of Max Wolff[22] needs but brief mention here. It is sufficient that with material from the same case of primary intestinal tuberculosis, Koch inoculated calves with diametrically opposite results, and that of the specimens which Wolff exhibited at the Berlin tuberculosis conference Baumgarten[3] suggested that the lesions were older than the experiment.

In addition to these which have been mentioned, positive results have been claimed by Schottelius,[23] Delepine,[24] Westenhöffer,[25] Karlinsky and others.

On the contrary, absolutely negative results are reported by Latta and Casco,[26] Cipolina,[27] Moeller,[28] Park, Hallock and Wilson,[29] and Pearson and Gilliland.[30]

In the experiments made at the Imperial Health Bureau[31] since the Prussian commission was appointed, a large number of cattle have been used in the elucidation of the question of the communicability of human tuberculosis to cattle. More particularly has primary intestinal tuberculosis of man been studied, as suggested by Koch, with a view of determining whether bacilli from such cases can produce bovine tuberculosis. In all, 57 cattle were infected with 41 cultures of tubercle bacilli from 40 different sources. Of these 41 cultures, 4 corresponded culturally and morphologically with the bovine type and by subcutaneous inoculation caused generalized tuberculosis in cattle. Three of these 4 cultures were obtained by passage through the guinea-pig from the mesenteric glands of children in whom it was reasonable to conclude that infection had occurred primarily through the intestine. The ages of the children were 3½, 5½ and 6 years, respectively.

These three cases in which the primary intestinal infection is attributed to bovine sources are, however, not entirely free from all objection. It is possible that the disease of which the children died may have been due to infection with human tubercle bacilli, and bacilli of pearl disease may also have reached the mesenteric glands through milk without having produced changes beyond localized lesions in these glands. An illustration in point is to be found in the experience of Kruse[32] while studying the relation of avian and mammalian tuberculosis. Cultures which were isolated from guinea-pigs which had generalized tuberculosis corresponded exactly in cultural and pathogenic characteristics with those of avian tubercle bacilli. These cultures when inoculated into chickens caused generalized tuberculosis, but when reinoculated into guinea-pigs they produced only local changes at the point of infection. Similar relations may have existed in the children from which the three bovine cultures were isolated, but the converse experiment not being permissible in man, we can only reason by analogy.

Granting that the primary infection of these three children was of bovine origin, examination of the autopsy findings of the 40 cases from which the material for inoculation was obtained shows that, in addition to these 3, there were 7 other cases of primary tuberculosis of the intestine and mesenteric glands in which the disease could not be transmitted to cattle. Thus of 10 cases of primary intestinal infection, only 0.3 had a bovine origin.

It is generally admitted that infection through milk or other food products of tuberculous animals can be rightly assumed only when the intestine or mesenteric glands are first involved, but such cases are far from frequent.

Among 1,407 autopsy records of the Tübingen Pathologic Institute, Grosser[33] found only 1 case. Eisenhardt,[34] in 1,000 autopsies of tuberculous subjects, also found but a single case. During 1902 and 1903, out of 5,142 necropsies at the mortuary in Hongkong, 35 per cent. of which were children under 5 years, Hunter[35] found only 5 cases. Bovaird,[36] basing his conclusion on the statistics of the New York Foundling Hospital, estimated that primary intestinal tuberculosis occurs in about 1 per cent. of cases among tuberculous children in New York. Northrup[37] reports 125 autopsies of children, in every one of which the bronchial glands were tuberculous, but in only one of which there was involvement of the mesenteric glands. Orth[38] reports 4.25 per cent. of primary intestinal affections in 47 children from the age of 3 months to 15 years.

Baginsky,[39] in 933 postmortem examinations of tuberculous children, never found the intestine affected without simultaneous disease of the lungs and bronchial glands.

To these findings and to those of many others the extremely high percentage of Heller and his pupils, Wagener and Hof, and the report of Councilman, Mallory and Pearce from Boston stand sharply contrasted. Of 714 children who had died of diphtheria, Heller[40] found 140 tuberculous, and of these 37.8 per cent. showed primary tuberculosis of the intestine and mesenteric glands. Wagener,[41] the assistant of Professor

22. Wolff, Max: Deut. med. Wochft., vol. xxviii, No. 32, p. 566.
23. Schottelius: Münch. med. Wochft., vol. xlix, 1902, No. 39, p. 1610; Ziegler's Beiträge, vol. xxxiii, Nos. 1-2, p. 32.
24. Delepine, Sheridan: Brit. Med. Jour., Oct. 26, 1901, p. 1224.
25. Westenhöffer: Deut. med. Wochft., vol. xxix, 1901, No. 14, Ver. Beilag., p. 110.
26. Latta and Casco: Tipografie Tiberina, Roma, 1903; Ref., Centralbl. f. Bakt., vol. xxxiv, 1904, Nos. 22-23, p. 707.
27. Cipolina, A.: Berl. klin. Wochft., vol. xl, 1903, No. 8, p. 163.
28. Moeller: Deut. med. Wochft., vol. xxviii, 1902, No. 40, p. 718.
29. Park, Hallock and Wilson: N. Y. Univ. Bull. of the Med. Sciences, vol. ii, 1902, No. 3, p. 142.
30. Pearson and Gilliland: Phila. Med. Jour., vol. x, 1902, No. 22, p. 843.
31. Kossel, Weber and Heuss: Tuberculose-Arbeiten aus dem Kaiserlichen Gesundheitsamte, 1904, No. 1.
32. Kruse: Cited by Weber and Boffinger, Tuberkulose-Arbeiten aus dem Kaiserlichen Gesundheitsamte, No. 1, 1904.
33. Grosser, K.: Inaug. Diss., Tübingen, 1900.
34. Eisenhardt: Cited by Goldschmidt, Monogr., Leipzig, 1894.
35. Hunter, Wm: Brit. Med. Jour., May 14, 1904, p. 1126.
36. Bovaird: Arch. of Ped., December, 1901.
37. Northrup; Med. News, vol. lxxxv, 1904, No. 7, p. 330.
38. Orth: Berl. klin. Wochft., vol. xli, 1904, No. 11, p. 265.
39. Baginsky: Deut. med. Wochft., vol. xxviii, 1902, Ver. B. No. 35, p. 270.
40. Heller: Deut. med. Wochft., vol. xxviii, 1902, No. 39, p. 696.
41. Wagener: Münch. med. Wochft., vol. l, 1903, No. 48, p. 2095.

Heller, reports on 600 autopsies made at the Kiel Institute during the year 1903. There were 76 subjects between 1 and 15 years of age, and among these alone there were 13, or 17.1 per cent., which showed primary intestinal or mesenteric tuberculosis. Hof,[42] who carefully worked out the 15,000 sections of the years of Heller's directorship, found primary intestinal tuberculosis without involvement of the lungs in 16.6 per cent. of the tuberculous subjects, and in addition in 8.5 per cent. in which miliary tuberculosis of the lungs appeared to have been secondary to intestinal lesions.

In this country, Councilman, Mallory and Pearce,[43] among 220 cases in which death was due to diphtheria, found tuberculosis in 35 with evidence, according to their interpretation, of primary infection through the intestine in 14, or 37.1 per cent.

The marked contrast in the statistics of Heller and his pupils and of those from Boston, as compared with those of others, can only be reconciled by the position of the observer as to what shall be interpreted as a primary and what as a secondary process. A differentiation of the pathologic lesions in the cadaver must ever be difficult and often impossible, for a tuberculous process, as a rule, does not remain confined to the first point of localization or to the regional glands.

The autopsy findings of Heller and his pupils show that they have classed as instances of primary intestinal tuberculosis cases in which the presence of cicatricial changes in the bowel was suggestive of antecedent tuberculous ulceration, and even cases in which the only lesions were calcareous or caseous mesenteric glands wherein neither histologic tubercle nor tubercle bacilli were demonstrated.

Inasmuch as many of these lesions may have had other than tuberculous origins, it is not likely that other pathologists have included like cases in their statistics. But, granting that these lesions actually represented obsolete tuberculous processes, it might be argued that they are suggestive of infections of bovine origin, which had not advanced beyond the seat of primary localization or the nearest glandular structure, a behavior which would bear a striking analogy to that of human tubercle bacilli when inoculated into cattle.

Still, the frequency of primary tuberculosis of the intestine is not a measure of the frequency of bovine infection, as is shown by the fact that only 3 out of 10 cases of primary intestinal tuberculosis included in the material of the Imperial Health Bureau were apparently caused by bovine tubercle bacilli. If now we estimate the frequency of primary intestinal infection from all sources at all ages at 1 per cent., which is probably a high enough average, then the proportion of such cases attributable to bovine sources is represented by 0.3 per cent. Infection with bovine bacilli occurs, then, in but 1 of 333 cases of all tuberculosis in man, and even this proportion would undoubtedly prove far in excess of actual occurrence if the true relation could be known, for in none of the 10 cases of primary intestinal infection could a bovine origin be shown in an individual above the age of 6 years.

From the foregoing analysis of the evidence which has been submitted up to the present time, it is apparent that Professor Koch's statement that cattle are insusceptible to human tuberculosis stands unrefuted. Neither have the experiments in cattle in regard to the relation of bovine infection to the frequency of primary intestinal tuberculosis, shown that the danger to man from the tuberculosis of cattle is by any means a paramount one as compared with that of human tuberculosis. For further aid in the determination of this, the vastly more important consideration, we may now proceed to study the question of infection of man through the milk and meat of tuberculous cattle, from the standpoint of clinical experience and other circumstantial evidence.

In regard to milk infection, a most unique position is taken by Behring,[44] who insists that practically all tuberculous infections in man have a bovine origin, and who has even gone so far as to announce that not a single case of epidemiologic human infection has been proved. Behring holds that the bovine tubercle bacillus is more virulent for man than the human tubercle bacillus. According to him, the permeability of the intestinal mucosa in early infancy (up to the second month) permits the penetration and passage of the bovine tubercle bacillus, ingested in milk, directly to the lymphatic glands. Here it lies dormant, causing no alterations in the tissue, in most instances, until with the physiologic changes of puberty or after intercurrent affections it is awakened to destructive activity. This period of latent infection constitutes the so-called predisposition, and without such infection in infancy Behring says there can be no phthisis in the adult.

In Behring's own statements a contradiction is at once apparent. If, as Behring says, the bovine tubercle bacillus is more virulent for man than the human tubercle bacillus, a more virulent disease must result from bovine than from human infection, and, moreover, if practically all infections occur in nurslings from infected milk, then the greatest prevalence of tuberculosis should be in the years of infancy and early childhood. Inasmuch as tuberculosis is well known to pursue a rapidly fatal course in infancy and in early childhood,[45] the greatest mortality should also occur in the earliest periods of life. Tuberculosis, however, is rare in infancy, as the observations of Westenhöffer,[46] Froebelius,[47] Baginsky,[48] Biedert,[49] Lannelongue,[50] Heubner,[51] and all pediatrists show. Moreover, the mortality increases from birth until about the fifth year and then declines to the age of puberty, after which it again steadily increases with advancing age. These facts are not to be explained by a dormancy, for varying periods of time, of bovine bacilli which have been deposited in the tissues, but by the opportunities for epidemiologic infection; and here, in passing, it should be remarked that not even dead tubercle bacilli can remain in the tissues without causing histologic alterations. In the first years of life the child is intimately associated with mother and nurse, who are but too often tuberculous. Now, the opportunity for constantly repeated infections is responsible for the increasing mortality rate. When

42. Hof: Diss., Kiel, 1903.
43. Councilman, Mallory and Pearce: Diphtheria, Boston, 1901, cited by Heller.

44. Von Behring: Beiträge zur Exper. Therapie, 1904, No. 8; Deut. med. Wochft., vol. xxix, 1902, No. 39, p. 689; Berl. klin. Wochft., vol. xli, 1904, No. 4, p. 90; Wien. klin. Wochft., vol. xvi, 1903, No. 12, p. 337.
45. H. Schmidt (Diss., Erlangen, 1896) reports 198 cases of pulmonary tuberculosis of children up to the age of 10 years, in which autopsies were made at the Pathologic Institute of Erlangen. In 194 of these cases the disease was of the caseous pneumonic form.
46. Westenhöffer: Berl. klin. Wochft., vol. xli, 1904, No. 7, p. 152.
47. Froebelius: Cited by Westenhöffer.
48. Baginsky: Deut. med. Wochft., vol. xxx, 1904, No. 12, p. 44.
49. Biedert: Cited by Westenhöffer.
50. Lannelongue: Cited by Westenhöffer.
51. Huebner: Lehrbuch der Kinderkrankheiten, 1903

the child reaches school age the contact with tuberculous elders becomes less close and less frequent, hence the decrease in the death rate after the fifth year. The increase of deaths from tuberculosis after puberty is in turn explained by increasing exposures to infection; for after the school years are past the individual comes in contact with the world at large, and in his association with a greater number of individuals, socially or in occupation or business, is again subjected to more numerous and more frequently repeated infections. In respect to this question the observations of Epstein[52] have an especial interest. Epstein in four years did not find a single case of tuberculosis in the autopsy material of the foundling asylum at Prag, where the children were received directly from obstetric clinics without having been associated with tuberculous mothers. In one series of 200 autopsies of children between the ages of 10 weeks and 10 months he found 9 cases of tuberculosis. Two of these children had been given out of the asylum for care and subsequently had been returned; one of the foster mothers was tuberculous; the other was not examined. The other seven children had been placed in the institution because their mothers had to be taken to the hospital on account of phthisis.

Again, if Behring's proposition be correct that the bovine tubercle bacillus is the chief and practically the only source of infection, the mortality from tuberculosis of children nourished with cow's milk should at least far exceed that of breast-fed infants; but this is not the case. In Berlin records have been kept of the method of feeding all children under one year who have died of tuberculosis, and the figures are cited by Fraenkel,[53] as follows:

In 1899 the total infantile death rate from all causes was 10,933; in 1900, 11,762; in 1901, 11,325; in 1902, 8,927. Of these there received mother's milk exclusively, 898, 895, 832, 733, respectively, of whom there died of tuberculosis in 1899, 11—1.1 per cent.; in 1900, 8—0.9 per cent.; in 1901, 4—0.5 per cent.; and in 1902, 5—0.7 per cent. Of children reared exclusively on cow's milk there died in 1899, 6,631; 1900, 7,305; 1901, 6.982; 1902, 5,246; and of these death was due to tuberculosis, respectively, in 79—1.2 per cent.; 70—0.9 per cent.; 63—0.9 per cent.; and 61—1.1 per cent. From these figures it will be seen that the maximum difference in any one year between the two series is represented by only 0.4 per cent., a fact which does not bear out Behring in his views.

In this connection additional facts are not wanting. Speck,[54] in order to determine the degree of danger of tuberculous infection in infancy from milk, made inquiry of the various sanatoria for tuberculous patients in Germany concerning the method of feeding of patients up to the third month of life. It was shown that of 4,467 phthisical patients of the sanatoria, that 3,455 had been breast fed, or 77 per cent., and 1,012 had received cow's milk, or 23 per cent. Of 259 cases reported by other physicians, 181, or 70 per cent., were breast fed. Jacob and Pannwitz[55] reported of 2,921 tuberculous patients that 1,877, or 67 per cent., were breast fed, and 969, or 33 per cent., were raised on cow's milk. Schroeder's report of 264 cases shows that 203 were breast fed, or 77 per cent., and 61, or 23 per cent., were fed with cow's milk, and Servae reports on 99 cases, of which 63 received women's milk, or 64 per cent., and 36 received cow's milk, or 36 per cent. These figures Speck has summed up, making a total of 8,010 cases of tuberculosis, of which 5,854, or 73 per cent., were breast-fed children, and 2,156, or 27 per cent., were raised on cow's milk. While these statistics represent conditions on the continent, the records of the Winyah Sanitarium at Asheville, N. C., show that 75 per cent. of tuberculous patients have positively stated that they had been breast fed. 15 per cent. could not make definite statements, and 10 per cent. were raised on cow's milk.

Another discrepancy between Behring's theories and facts Biedert[56] has remarked in the following: In the lower Pfalz district there are 182 head of cattle per 1,000 inhabitants, and according to meat inspection there are 7.5 per cent. of tuberculous cows. Here the mortality from tuberculosis is 35.9 per 10,000 inhabitants. In the upper Pfalz there are 314 head of cattle per 1,000 inhabitants and of tuberculous cows 17.3 per cent. Here the mortality from tuberculosis is 29.1 per 10,000.

Again, Tonzig[57] cites the statistics of the city abattoir of Padua, which show that bovine tuberculosis occurs with rarity. Yet this city furnishes the greatest mortality of all Italian cities from tuberculosis with a remarkable frequency of intestinal tuberculosis.

In a letter to the editor of the *Medical Record* Carter[58] says that the average mortality from tuberculosis in the city of Havana represents more than 21 per cent. of the total death rate, and yet raw cow's milk is never used in Havana.

In Sweden, where for generations nearly all mothers have nursed their children, we find a higher death rate among children from tuberculosis than in certain other countries where artificial feeding is frequently resorted to. Hirsch[59] cites the comparative statistics for four countries as follows: Switzerland, 1.86; Prussia, 2.94; Norway, 2.21; Sweden, 3.5.

According to Babes,[60] tuberculosis is very prevalent in Roumania, where the children receive no cow's milk, and according to Arthur Meyer,[61] in England, where milk is used raw much more than in Germany, the tuberculosis mortality is less than on the continent, although Ransome, Delepine, Boyce and others have shown that milk contained tubercle bacilli in large numbers of the samples which they examined. On the other hand, in Sardinia and in Sicily, where bovine tuberculosis, according to Dr. Vestea, is almost unknown, the tuberculosis of man causes a greater mortality than in England.

Of Greenland, Heymann[62] tells us that infants are almost exclusively breast fed, and yet tuberculosis is so prevalent that it is easier to name those who are free from it than to attempt to report the widespread presence of this disease.

52. Epstein: Cited by Neumann, Deut. med. Wochft., vol. xix, 1893, No. 13, p. 306.
53. Fraenkel, B.: Deut. med. Wochft., vol. xxx, 1904, No. 6, p. 227.
54. Speck, A.: Zeit. f. Hyg., vol. xlviii, 1904, No. 1, p. 27.
55. Jacob and Pannwitz: Entstehung u. Bekämpfung der Lungentuberculose, Leipzig, 1901, vol. i, p. 253.
56. Biedert: Berl. klin. Wochft., vol. xxxviii, 1901, No. 47, p. 1177.
57. Tonzig: Cited by Ott, Deut. Aertzte Ztg., No. 23, December, 1902.
58. Carter: Med. Rec., vol. lxv, 1904, No. 8, p. 309.
59. Hirsch: Cited by Oppenheimer, Münch. med. Wochft., vol. li, 1904, No. 5, p. 204.
60. Babes: Rumän. Akademie der Wissenschaften, Feb. 6, 1904; Ref., Münch. med. Wochft., vol. li, 1904, No. 27, p. 1218.
61. Meyer: Berl. klin. Wochft., vol. xli, 1904, No. 10, p. 257.
62. Heymann, B.: Zeit. f. Hyg., vol. xlviii, 1904, No. 1, p. 45.

According to Cobb,[63] tuberculosis in all its forms is the greatest scourge in China. Nevertheless, the use of milk as a food by the Chinese is so rare that one may practically say they do not use it. Very few cattle are raised by the Chinese and these are mostly used for ploughing.

Finally, we are informed by Shiga[64] that bovine tuberculosis was unknown in Japan until thirty years ago, when foreign cattle were imported, and from Professor Asyama[65] of Tokio we learn that tuberculosis has been widely disseminated in Japan for centuries, in spite of the fact that until a few decades ago the feeding of nurslings has been only by the mother's milk or that of wet nurses, for ritual and religious reasons.

From such an array of facts, to which many more might be added, Behring's position is clearly shown to be untenable, and it does not appear that the milk of tuberculous cattle is of very great significance in the spread and perpetuation of tuberculosis in man. Nevertheless, it must not be forgotten that isolated instances have occurred from time to time in which it seemed most reasonable from the clinical evidence to attribute infection to bovine sources.[66]

While in such cases the evidence has pointed most strongly to an infected milk supply, yet it has been only circumstantial in character, and there has been no means of excluding absolutely a possible human source of infection. One or two cases may be quoted here which make this point clear.

In the celebrated case of Ollivier,[67] which he communicated to the Academy of Medicine of Paris in 1891, in the course of a few years, in a girl's school 13 of the pupils became ill of tuberculosis, 6 of whom died. Among them were several cases of primary intestinal tuberculosis. Investigation brought to light the fact that a cow which had been kept in the institution for some years suffered from tuberculosis of the udder, and that the milk from this cow had been drunk by the pupils. Here was a case in which the clinical evidence appeared strikingly convincing, and it has been cited over and over again as a classical example of infection through milk containing *Perlsucht* bacilli. The second communication of Ollivier in regard to this case seems to have escaped the notice of all those who have made use of it as a proof of the danger of milk infection. At the very next session of the academy, Ollivier was obliged to admit that he had been mistaken. He had since learned that the milk of the cow in question had not been drunk by the pupils, but by the teachers and domestics of the school, among whom not a single case of tuberculosis had developed.

In the oft-quoted case of Dr. Stang,[68] a 5-year-old boy showed for some time symptoms of an abdominal affection. Ascites appeared and enlarged lymphatic glands could be felt through the abdominal wall; after a few weeks the boy died. The autopsy showed tuberculosis of the lymph glands of the abdomen, of the serous membranes and of the lungs. There had been no history of tuberculosis in the family on either side for two generations, but it was found that the child had drunk for a year the warm milk directly from a cow which later died of tuberculosis. It is not stated that the cow had tuberculosis of the udder, and it should be remarked that in such a case possible sources of human infection can not be absolutely excluded.

The following instance reported by Demme[69] may serve as an illustration of the care that is essential in attributing cases of tuberculosis to certain sources of infection. In 4 cases of tuberculosis in infants, autopsy showed the disease to be confined to the intestine. It was afterward discovered that these children were all infected by the same nurse, who was found to have a tuberculous affection of the right antrum of Highmore communicating with the oral cavity through a fistula. It was the custom of the nurse to feed the children with a spoon and to test the temperature of the food by placing the spoon between her lips, and if too hot, to blow on it to cool it. Thus she infected the children with tubercle bacilli contained in her saliva. Now, if the unusual affection of the nurse had not been discovered, and, on the other hand, it could have been shown that these children had received milk from a tuberculous cow, four more cases of milk infection might have been added to the literature.

There still remain for consideration infections of the skin in the persons of those who handle tuberculous meat, and which are attributable to bovine tubercle bacilli. These cases all have this in common, that the tuberculous process remains localized and does not extend to the internal organs. In a number of such cases which were recently demonstrated before the Berlin Medical Society by Professor Lassar,[70] in not a single instance had there been an extension of the affection beyond the point of inoculation, although the local lesions had existed for a long time, in one case for over ten years. It must be conceded that if such infections were prone to lead to generalized tuberculosis, butchers should show a higher mortality from tuberculosis than those pursuing other occupations. But this is not so, and it has been shown for the city of Copenhagen by Heilberg[71] that with an average of 618 butchers altogether, but 25 have died of tuberculosis in ten years. In regard to accidental cutaneous infections with human tuberculous material, however, little need be said, for it is well known that large numbers of such cases are on record in which the local affection extended by way of the lymphatics and caused the death of the subject from generalized tuberculosis.

With all the circumstantial evidence available, the question of the susceptibility of mankind to bovine tuberculosis can not be satisfactorily settled. The problem can only be solved by experiments in human beings, and these are excluded. Such experiments, however, have been made, although they were undertaken with another motive.

Based on Rokitansky's theory of the existence of antagonism between tuberculosis and carcinoma, over half a dozen patients who suffered from inoperable malignant disease were inoculated with bovine tubercle bacilli in a last effort to save them from inevitable death. At that time the belief was current that the bovine tubercle bacillus and the human germ were identical, and, therefore, as cultures of the latter were not available, a cul-

63. Cobb, J. O.: Zeit. f. Tuberculose u. Heilst., vol. vi, 1904, No. 1, p. 1.
64. Shiga: Zeit. f. Hyg., vol. xlvii, 1904, No. 2, p. 209.
65. Schoenborn: Beiträge zur Klinik der Tuberculose, vol. ii, 1904, No. 2, p. 103.
66. In the Amer. Jour. of the Med. Sciences, vol. cxxvi, 1902, p. 884, will be found an article by Dr. George M. Kober, in which 86 cases are tabulated in which infection was supposed to have come from bovine sources.
67. Koch, R.: Deut. med. Wochft., vol. xxviii, 1902, No. 48, p. 857; Transl. Jour. of Tuberculosis, vol. v, 1903, No. 1, p. 40.
68. Aerztliches Intelligenzbl., München, 1876, vol. xxiii, p. 34.
69. Demme: Cited by Grosser, Diss., Tübingen, 1900, p. 11.
70. Lassar: Berl. klin. Wochft., vol. xl, 1903, No. 31, p. 708.
71. Heilberg, P.: Zeit. f. Tuberculose u. Heilst., vol. v, 1904, No. 3, p. 235.

ture of the bacilli of pearl disease which had proved highly virulent for rabbits was used. After inoculation the patients survived, respectively, from several months to a year, and when subsequently they died of their malignant disease it was found that not in a single case had an infection resulted. Baumgarten,[72] as official prosector of the hospital in which the experiments took place, performed the autopsies. He found at the point of inoculation only small scars, the tissues of which contained no tubercle bacilli, and he assures us that a critical macroscopic and microscopic examination of the adjacent lymph glands and of the various internal organs failed to reveal tubercles or tubercle bacilli.

Any discussion of the relation of human and bovine tuberculosis is incomplete without at least a brief consideration of the subject from the standpoint of prophylaxis. The information which is available regarding the danger to man from bovine infection clearly indicates, as Professor Koch maintains, that such infections are extremely rare in comparison with the overwhelming preponderance of epidemiologic infections. Nevertheless, that progressive infection of man and more particularly of children can occur from bovine sources seems to have been shown by the experiments of the German Imperial Health Bureau. On the other hand, the cases of infection of human beings with *Perlsucht* bacilli, which Baumgarten has published, proved absolutely negative. The subjects of these experiments were adults, however, and it is not beyond the realms of possibility that the result might have been different had a number of infants been inoculated.

From the standpoint of prophylaxis, we are not so much concerned with the frequency of infection of man from bovine sources as with the question: Do such infections occur at all? So long as it can not be demonstrated beyond all doubt that they do not, preventive measures against bovine tuberculosis must remain imperative.

The object of all prophylaxis against tuberculosis is the eradication of the disease; on this point all are agreed. But, in order to accomplish this most certainly and most quickly, the greatest efforts should be made to protect against the greatest danger. On this account the lesser evil need not be ignored.

As Professor Koch pointed out, the danger to man from the tuberculosis of cattle can be overcome by boiling the milk and by sufficiently cooking the meat of tuberculous animals which may be used for food. This more simple and inexpensive prophylaxis against bovine tuberculosis, Koch recommended in order that the vast sums which must be required in the way of remuneration for tuberculous animals judicially destroyed might be diverted toward the establishment and maintenance of a more thorough and more effective prophylaxis against the chief source of human infection, the tuberculosis of man himself.

But, were it proved that bovine tubercle bacilli could at the very most cause only localized non-progressive lesions in man, the use of food products of tuberculous animals would still be objectionable, for such lesions can lead to serious impairment of nutrition and possibly to death from tabes mesenterica.

The flesh or the milk of diseased animals is not fit for human consumption under any circumstances, and for this reason alone, if for no other, the careful inspection of meat and milk would still be indicated and the eradication of the tuberculosis of cattle would always be desirable on this account, as well as for purposes of economy.

72. Von Baumgarten: Berl. klin. Wochft., vol. xxxviii, 1901, No. 35, p. 894.

THE TREATMENT OF GONORRHEAL ARTHRITIS BY HYPEREMIA.

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All physicians who have seen gonorrheal arthritis know how unsatisfactorily the usual treatment—rest, massage, passive movements, salicylates, etc.—often proves in chronic cases, and how hard to overcome in those cases is the extreme painfulness and the stiffness of the diseased joint. It seems to me worth while, therefore, to call attention to a method of treatment which, so far as I have observed, in this country, has by no means found the notice and practice it deserves. I refer to congestive hyperemia by damming according to Bier, which, as his assistant, I saw him employ.

As is generally known, Bier recommended hyperemia by damming at first for tuberculous joint diseases; later he employed it also for other diseases, and in his book, *"Hyperæmie als Heilmittel,"* writes: "Yet much more marked is the effect of hyperemia by damming on that form of gonorrheal joint inflammation which is so extremely painful. In these cases the pain becomes easier in from one-half to one hour after the application of the rubber bandage."

During the last few months I have had occasion to employ, and with the best results, hyperemia by damming in several of those cases of gonorrheal arthritis which are marked by extreme pain and a tendency to stiffness.

CASE 1.—Man, aged 34.

History.—Five months after an apparently slight gonorrheal infection he suddenly experienced severe pain in the right knee. The joint became severely swollen and was soon quite stiff. For about five weeks he was treated by his physician with salicylates, etc., and with tincture of iodin without any result. During this time the pain was so great that he was given narcotics in order to make him sleep. The circumference of the joint was 8.5 cm. larger than that of the other knee.

Treatment and Result.—While the joint was in this condition the rubber bandage was applied. The very first night the patient wore the bandage he slept without any narcotic and in a few days he was able with the help of a stick to take a few steps and with almost no pain. Soon the pain entirely ceased and the patient walked quite well, but the stiffness of the joint improved comparatively slowly.

CASE 2.—A woman, aged 27.

History.—For nine weeks she had suffered with an inflamed ankle joint with much swelling and very severe pain. For weeks she was treated for rheumatism and without result.

Treatment and Result.—In this case also after application of the rubber bandage in a few days there was marked improvement and she began to walk quite well. The recovery was somewhat retarded, due to an acute cold and to catarrh of the bladder, which the patient refused to have properly treated; nevertheless, after a short time, she was able to put on her boots and felt so well she wanted to walk home.

CASE 3.—Another case was that of a woman, aged 29, who, on previous occasions had made herself remembered in the hospital because of her timidity and lack of self-control.

History.—This patient, eight weeks before the beginning of the treatment, was said to be severely ill with measles and grip. After two days' illness, severe pain started in the right knee and continued until the beginning of the treatment with

the rubber bandage. In this case gonococci could not, as in the two foregoing cases, be found, but the symptoms clearly pointed to a gonorrheal inflammation in the right knee. The joint was severely swollen, extremely painful, and any movement absolutely impossible. Only with the greatest pain could the patient turn herself in bed.

Trreatment and Result.—Soon after applying the bandage the pain grew less, and continued to grow less until at the end of ten days she was able to take a few steps without pain. Though the extraordinary timidity of this nervous woman kept her from exercising and therefore prevented a more speedy return of the joint movement, yet the patient was soon able to walk around all day and the pain completely disappeared.

In describing the technic of damming I will follow the directions given by Bier himself in his book entitled *"Hyperæmie als Heilmittel,"* and I will restrict myself to the technic as it is used for gonorrheal arthritis, omitting the employment of the method for other diseases.

For the damming it is best to use a thin pliant rubber bandage, the same as is used to make a limb bloodless for an operation. If such a bandage is applied moderately tightly in several layers—not necessarily directly over each other—around a limb, it will soon be noticed that the subcutaneous veins swell, that the skin becomes of a red hue which is slightly tinged with blue, and that the limb becomes bigger and edematous; it feels warm to the touch and gives the subjective sensation of increased warmth in the limb. If there is pain in the joint it ceases, as a rule, very soon, and the stiffness of the joints becomes gradually less. The rubber bandage in this case ought not of itself to cause any uncomfortable feeling; the patient can even forget its presence. This degree of hyperemia, the so-called *"heisse Stauung"* (hot damming) is the right one and the only one that can be used as a remedy.

It is sometimes very difficult to obtain this degree of hyperemia, and it requires careful attention and some practice to apply the bandage in such a way that the arteries are not compressed, while at the same time the veins are so far compressed as to partly check the reflux of the blood, so that the flow of the blood is retarded while the circulation is not entirely suspended.

In applying this treatment to a knee or an elbow joint sometimes it seems easier to get the right degree of hyperemia by bandaging the distal part of the joint with a flannel bandage. Other aids, recommended by Bier, to obtain the "hot damming" are: Previous heavy coating of the diseased joint with tincture of iodin, which causes a slight inflammation, and then, in the inflamed area, the bandage causes a very good hyperemia; or one can make the limb for a few minutes bloodless, according to Esmarch, then wait for the reactive hyperemia and afterward dam with the bandage the copious amount of blood from the reactive hyperemia.

To prevent any unpleasant results, such as atrophy of the muscles or irritation of the skin at the place where the bandage is applied, a few layers of gauze can be interposed between the skin and the rubber. It is also expedient to change the place of the bandage, for instance, to put it at night directly above the diseased joint and during the day farther away from the joint.

If the bandage is too tight, the skin of the limb soon looks grayish blue, and there appear whitish and particularly vermilion-colored spots, which grow larger and larger so long as the too tightly drawn bandage remains. The joint is cold to the touch—so-called *"kalte Stauung"* (cold damming)—while there is, as a rule, even now a subjective feeling of warmth; also there appear under these conditions paresthesia and pain. In rare cases, Bier has also seen what he calls white damming, in which there seems to be especially a damming of the lymphatic vessels.

All these latter phenomena, blueness and coldness of the limb, white or vermilion-colored spots, paresthesia and pain, show that the bandage is too tight and must be loosened.

To the application of the hyperemia as a remedy we become entitled and impelled through observation of nature.

In every function—in growth, in regeneration, in all remedial efforts of our system—nature uses hyperemia either active (arterial), or passive (venous). Our efforts, therefore, must be to find out the ways nature takes and to help her by limiting the hyperemia if it gets stronger than necessary—antiphlogistic régime in acute inflammation—or by increasing the hyperemia if nature does not seem to react with enough force against the disease, as seems to be the case in chronic arthritis and in some cases of gonorrheal arthritis.

If we ask now what are the effects of hyperemia, we find that the first and most marked effect is the lessening of pain, which every physician has noticed who has applied hyperemia by damming or by hot air, for the effect of hot air is hyperemia. If one properly employs the hyperemia by damming, this anodyne effect is so marked that Bier emphatically calls attention to the fact that the bandage is not properly applied if, after its application, the pain is increased instead of being lessened.

But it is not the anodyne effect alone that makes the hyperemia a remedy. Hyperemia by damming certainly has a bactericide effect, whether this depends on increased leucocytosis, on a larger quantity of serum with its alexins and products of the change of matter in the bacteria, or on increase of the carbonic acid and thereby of the alkalinity of the blood.

Finally, hyperemia by damming has a dissolving effect. In those stiff joints of gonorrheal arthritis in question, as well as in joints with chronic arthritis, the adhesions consisting of connective tissue become infiltrated with serum, swell, and are dissolved and may be removed with the serum by means of massage, which should be employed after the bandage is taken off.

Only the above-described, so-called *"heisse Stauung"* (hot damming) has these effects, and I wish to emphasize the fact that special attention must be given to obtain the right degree of hyperemia and to maintain the same during the time the bandage is applied. At the first application of the bandage the patient must be strictly admonished to tell at once if he feels more pain, if the joint becomes blue or pale, or if it feels cold or numb. In the beginning of the treatment of these gonorrheal joints it seems best to let the bandage remain only a few hours; but soon the time must be lengthened until in a few days the bandage should remain for ten hours during the day and ten hours at night. After the removal of the bandage it is well to massage slightly and to move the joint, and the patient must as soon as possible leave his bed.

The results of this plan of treatment of those painful cases of gonorrheal arthritis which tend to stiffness in most cases, so far surpass all other methods that I most urgently recommend the hyperemia by damming according to Bier.

SMOKELESS POWDERS.

THE NATURE AND EFFECTS OF THE DELETERIOUS GASES GIVEN OFF IN THEIR EXPLOSION.*

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Ever since the introduction of the so-called smokeless powders, injurious effects have been observed from their use. In small quantities, the gases resulting from the explosion of powders of this class, cause varying degrees of disturbance in the cardiac and vasomotor apparatus. "Dynamite headache" has become a common phrase among those who work in the manufacture of the powders; among miners, who use them for blasting purposes, and among sportsmen, soldiers and rifle shots, who use them in firearms. In larger quantities, these gases have produced profound intoxications, and have caused numerous fatalities. Haldane[1] says: "In the gold mines in India and in the Transvaal, accidents involving the loss of as many as twenty men at a time have sometimes occurred in this way from dynamite catching fire underground, and serious injury to health may easily be caused by the fumes of imperfectly detonated high explosives where the ventilation is bad." Key[2] says: "Many instances are recorded of fatalities due to the inhalation of these fumes." An accident occurred from the fumes of exploding nitroglycerin, during the construction of the Severn tunnel, in which two men lost their lives. These cases are fully reported by Ford,[3] who quotes other cases by Dupré. A striking instance of the lethal effects of the fumes of modern high explosives was seen in the Philippine Islands, when fourteen men perished after a blast in the quarries of Mariveles. They sought refuge from the explosion in a protected gallery in the pit-like quarry. The fumes of the explosion settled into the quarry, and before aid could be given the men they were all dead. Numerous isolated instances have been reported.

It seemed profitable to determine, if possible, the particular gas or gases causing these symptoms and to study their effects. For this purpose the experiments which are here detailed were undertaken. Some very positive and interesting results were obtained. The literature bearing directly on the subject is very sparse. With the exception of some simple experiments with smokeless powders, by Torel, the field is a new one. The results run a close parallel to some of the results obtained by Haldane in his masterly experimental studies of the effects of poisoning by carbonic oxid.

The following is a brief extract of a paper by Torel,[4] a medical officer of the French navy. He refers to a number of cases occurring on the *Massena*: "Six shots were fired in rapid succession from a 274 mm. gun in a closed turret. There was a gentle breeze blowing toward the muzzle of the gun in such a fashion that when the breach block was opened after each shot a large portion of the gases of the explosion was blown into the turret. A number of the men suffered slightly from the effect of the gases, while one was very severely affected. There was a complete loss of consciousness. The face was pale and covered with a cold sweat; the pupils were dilated. There were convulsive movements of the body and limbs; the respiration was labored and jerky; the pulse small and irregular, and the beats of the heart feeble and tumultuous. After he recovered consciousness, he complained of severe headache, of lassitude and of epigastric pain. He stated that when he lost consciousness he had severe vertigo and anginose pain in the precordium." Torel believes that the embarrassment of speech, the delirum and the convulsions observed in this case, point to a central intoxication by nitrous vapors rather than to poisoning by CO, in which the action is slower and more prolonged. To test the toxicity of the vapors he made two experiments on rats. The first rat was placed under a bell jar, of a capacity of 160 liters, and a mass of powder weighing 4 grams ignited and burned under it. The rat died in five seconds, and was in a state of rigidity with dilated pupils. He allowed a portion of the gas to escape from the bell and placed another rat under it. The rat died in fifteen seconds, after strong convulsions.

Not strictly related to this inquiry, but casting a great deal of light on some of the effects, is the so-called "cordite eating" in the British army. The first mention I can find of this practice is by Purdy:[5] "There were a few cases where men were admitted with a temperature of 103 degrees or 104 degrees one day, and after a night in hospital the thermometer registered normal. It was found that one or two of the 'weary Willies' and 'tired Tims' had resorted to eating cordite as a means of creating a temperature, and so bluffing the doctors. This means of raising the temperature was discovered by the men noticing the effects of cordite fumes when lighting a pipe with a stick extracted from a cartridge."

A fuller report on this subject was made by Jennings.[6] The following is a brief abstract of his paper; he records the cases of several men who were in the habit of eating cordite for the sake of the intoxication it produced: "Cordite, when taken in the strand form, rapidly produces a violent splitting headache in the temporal and occipital regions, the headache continuing all day." "As an experiment, I tried one-fourth of a strand from a Lee-Metford cartridge, which I kept in my mouth and sucked for two minutes. Its diminution in size was scarcely appreciable, and yet I experienced the most racking, splitting headache that I ever felt in my life, together with hammering and ringing noises in my ears; the headache lasted quite thirty-six hours." "Its physiologic action is similar to but slower than amyl nitrite, viz., throbbing headache, flushing of the face, visible carotid pulsation, giddiness and disordered action of the heart." When taken with beer or tea it appears to produce heavy sleep, followed by a stupor lasting approximately from five to twelve hours. He also notes the habit of the men lighting their pipes with sticks of cordite and says that when so used it gives the smoke a not unpleasant sweet taste and a slight passing headache or giddiness. Cordite alone does not seem to make men crazy, but taken with beer or spirits it brutalizes the mildest man and makes a temporary maniac of him. He also reports from personal observation that the habit seems apparently to age a man rapidly and to make him exceedingly negligent of his personal appearance.

* Special report to the Surgeon General, U. S. Army, and published by his authority.

1. Quoted by Oliver: Dangerous Trades. pp. 614 *et seq.*
2. A. Cooper Key: In Oliver, Dangerous Trades.
3. Ford: Chief Inspector of Explosives, British Government Report, No. 26, Oct. 30, 1879.
4. Torel: Accidents Produced by the Deleterious Gases of Smokeless Powder, Archives de Médecine Navale, 1903, p. 373.
5. Purdy: New Zealand Medical Journal, March 31, 1902.
6. J. W. Jennings, Major R. A. M. C., D. S. O., Journal Royal Army Medical Corps, October, 1903.

My experiments were divided into two groups. One group, to determine the nature of the gases given off in the explosion of smokeless powders, and the other group to determine the effect of these gases on man. The first group was made by firing blank cartridges into a sealed box and then aspirating the gases of the explosions through various test reagents. The second group of experiments was made in a closed and sealed room of about 1,200 cubic feet capacity. The subjects of the experiments were myself, Sergeant, First class, Clare and various privates of the hospital corps detachment on duty at this station. After entering the experiment building, the door was sealed and a varying amount of powder was exploded in a United States magazine rifle. The average exposure to the action of

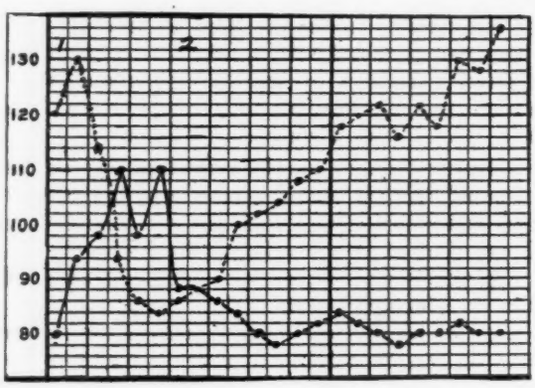


Chart 1.—Continuous line shows pulse; dotted line shows blood pressure. Amount of powder exploded equals 10 grams. 1. Exposed to the fumes. 2. Out of the fumes. Observations ten minutes apart.

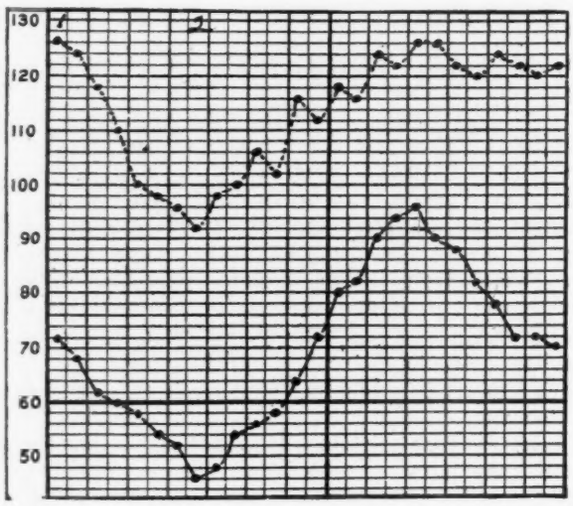


Chart 2.—Showing delayed action on pulse and blood pressure. Observation interval ten minutes. 1. Entered fumes. 2. Out of the fumes.

the fumes was one hour. During this time observations on the heart, vaso-motor system, blood pressure, hemoglobin and temperature were made.

It required considerable resolution to keep these experiments going, and they were carried over a long time, on account of the necessary intermissions that had to be made between them. This was due chiefly to the headache that invariably followed the experiments, frequently extremely severe and lasting for from four to forty-eight hours. Numerous sphygmographic traces were made. A great variety of powders was tried, but as no appreciable differences could be found in their action, with the means at hand, the experiments were completed with the United States Army small-arms powder. This powder contains gun cotton, nitro-cellulose, nitroglycerin, a metallic nitrate accelerator and an unknown deterrent. The action and function of these deterrent bodies will be considered later. Positive results were obtained with as small an amount of powder, exploded, as 8 grams.

The first and most notable effect of the powder fumes was on the heart and circulation. In small amounts (8 to 10 grams of powder, exploded) there ensued in from five to ten minutes palpitation of the heart with rise in the pulse rate. (Chart 1.) In only one instance, with the fumes from 7 grams of powder, there was a slow but steady fall in the pulse rate to 46, with

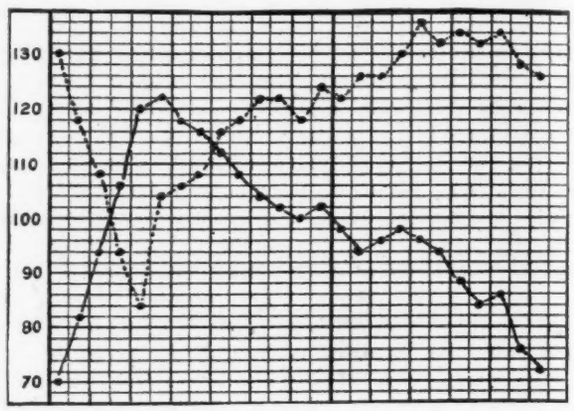


Chart 3.—Showing the effect of 20 grams of powder. Observation interval five minutes.

a great sense of distress in the chest, marked cyanosis and a tendency to faintness. In this instance the rise, as seen in Chart 1, No. 1, followed one hour after leaving

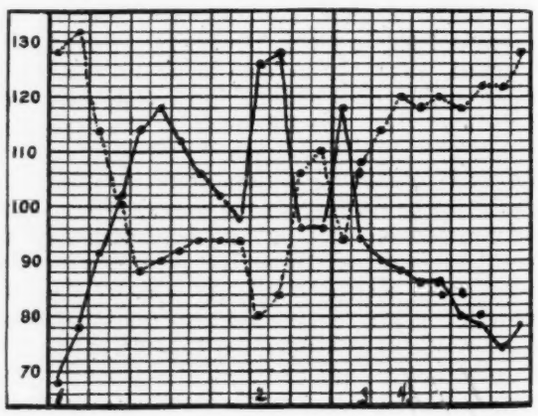


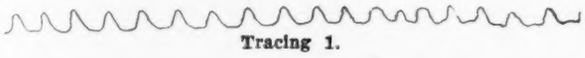
Chart 4.—Showing the full effect of smokeless powder fumes. Amount of powder exploded 37 grams. 1. Entered fumes. 2. Walked thirty steps. 3. Same. 4. Left fumes. Interval between observations five minutes.

the fume room, and then was the same as usually observed. (Chart 2.)

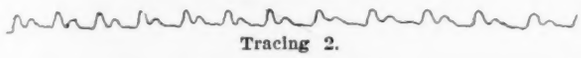
In larger quantities of the fumes, from 20 grams of powder, the effect on the heart was more pronounced. In a few instances an initial but very brief fall was noted. (Chart 3.)

Following this the pulse rose rapidly to 110 and 115. There was a most distressing, tumultuous feeling in the chest. The face was flushed, the pupils dilated. In from fifteen to twenty minutes cyanosis appeared. Chart 4 shows the full effect of smokeless powder fumes.

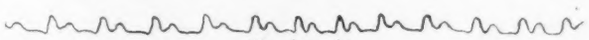
In this experiment, 37 grams of powder were exploded, and it was found that this was about the limit of safety, beyond which I could not go, without unjustifiably endangering everyone concerned in the experiment. The initial pulse was 70. It rose rapidly to 118 and then began to fall. When slight exercise was tried, walking thirty steps at a slow walk, it rose to 128, became arrhythmic and markedly dicrotic. The loss of vasomotor tone was very evident in the fall of blood pressure with the increase in the rate of pulsation. The dicrotism was apparent to the finger, and was marked in the sphygmographic traces, which are here shown. (Tracings 1, 2, 3.) After exposure to the fumes for thirty minutes, the man staggered and swayed in walking. The power to remain stationary, with the eyes closed, was almost abolished. The reflexes were not increased. In addition to great distress in the chest and angor cardii, he complained of a severe feeling of oppression in the head, smarting of the eyes and dryness of the throat. There was marked loss of hearing, diminished acuity of vision and apparent mental confusion. The sense of oppression in the head rapidly developed into a violent general headache, more marked in the occipital region, which lasted thirty-six hours. This particular experiment has been detailed at length because it is the typical expression I found, over and over again, of the full effect of the powder fumes.



Tracing 1.



Tracing 2.



Tracing 3.

Tracings 1, 2 and 3 correspond to Chart 4 and illustrate the loss of vasomotor control and dicrotism.

The influence on the vasomotor system was equally pronounced. An initial flushing, particularly of the face, was always seen, and, with this flush, there was a subjective sense of heat. The flush was followed by cyanosis, apparent in the lips, finger nails and malar prominences. The color was a curious one, and suggested turgidity rather than lividity. The blood pressure fell rapidly with the rise in the pulse. The average fall was 50 points, from 130 to 80 mm. of mercury.

Respiration showed less change than the other functions. There was always some hyperpnea, and not so much a sensation of air hunger as a feeling of respiratory insufficiency; a subjective sense of unsatisfied breathing. Where there was full exposure to large amounts of the fumes, nose bleed was frequently observed.

Under the same circumstances locomotion and co-ordination were markedly affected. Swaying and staggering on walking was commonly observed. Walking along a line marked out on the floor was difficult. Even in small doses, when the feet were placed together and the eyes were closed, there was a curious sense of instability and a subjective feeling as though one were about to fall. In large doses the swaying was very apparent, while in full doses the position could not be maintained at all. No alteration in the reflexes was observed. Failure of co-ordination was also shown in increased difficulty in performing manipulations involving careful movement. Thus it became very difficult to make the sphygmographic traces, and there was more or less tendency to drop small articles like pencils, thermometers and tracing papers.

I could not satisfy myself that there was any influence whatever on the body temperature. The sensation of heat has already been mentioned, but the thermometer failed to show any actual rise. The observation by Purdy,[5] already quoted, of the temporary rise observed in men who ate cordite for the purpose of malingering, led me to expect some temperature variations. However, none were observed, and, therefore, there must be some difference in the action of cordite powder fumes and the internal effect of cordite when eaten, in this respect, although most of the other phenomena are somewhat similar.

Although I could find no effect on the temperature of the body, it was noticed that the temperature of the outside air had a marked influence on the effect of

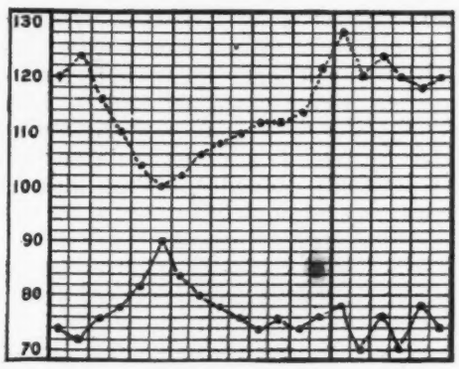


Chart 5.—Showing influence of heat and cold. Amount of powder exploded 20 grams. Temperature of room 74 F. The reaction is very moderate.

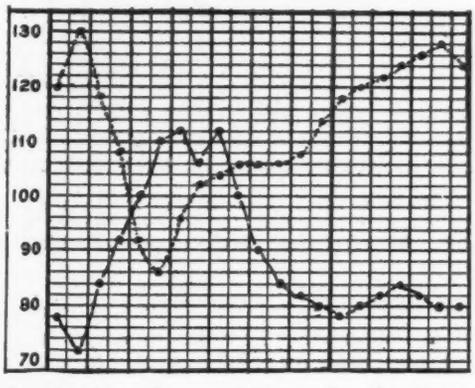


Chart 6.—Showing influence of heat and cold. The conditions are the same as in the preceding chart excepting the temperature of the room, 47 F. The reaction is more decided.

the powder fumes. Charts 5 and 6 show this very plainly. Generally speaking, it was found that decrease in the temperature increased the effect of the powder fumes. Both of these charts show experiments on the same man made under exactly similar conditions, excepting the room temperature. Chart 5 shows the effect of the fumes of 20 grams of powder on the man at a room temperature of 74° F. It will be observed that the reaction is very moderate. Chart 6 shows the experiment repeated with the same man and the same quantity of powder at a room temperature of 47 F. The effect is very much more marked.

I do not pretend to interpret this phenomenon, but a very similar observation is recorded by Haldane[7] in

7. John Haldane: The Journal of Physiology, 1895, vol. xviii, p. 430.

his studies of CO poisoning: "Another point which may probably be of importance is to prevent fall of temperature. My attention was first called to this point by observations on mice and subsequently by a fact communicated to me by one of the rescue party after the terrible colliery explosion in South Wales in 1894. It was noticed that some of the men found still alive, but suffering from the effects of after-damp, got worse and gradually sank when brought to the fresh air at the bottom of the down-cast pit. At this point the air would be cooler and dryer than in the workings. The fall is apparently accelerated by dilatation of the blood vessels of the skin."

It is possible that this explanation may apply to these observations as well; that the dilation of the vessels produced by the powder fumes is augmented by the peripheral dilation caused by the cold. I also made an effort to determine the effect of moisture by saturating the room with steam. The effect of the fumes in moist air seemed to be less than in dry air, but of this observation I am not by any means sure.

Vision became less acute under the influence of the powder fumes, the average diminution being from 5/20 to 7/20. The visual fields were slightly contracted uniformly. I could discover no scotomata. Hearing was more decidedly obtunded. When the full effect of the fumes was obtained there seemed to be a loss of

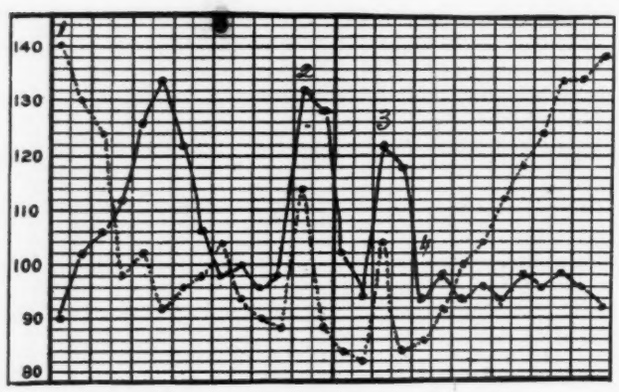


Chart 7.—Showing effect of alcohol and powder fumes. Amount of powder exploded 25 grams. 1. Entered fumes. 2. Exercise. 3. Exercise. 4. Left fumes. Interval between observations five minutes.

nearly one half in hearing. A degree of mental confusion was also observed, chiefly expressed in dullness and failure of concentration. "Dynamite headache" always followed the experiments. It varied in intensity, but was usually severe. Frequently it was almost intolerable, on account of the severe, crashing, splitting pains. Occasionally it was milder, with a general sense of constriction and a localized pain in the occipital region. It lasted from four to forty-eight hours. It is undoubtedly congestive in character and due to the filling up of the cerebral vessels from vasomotor paralysis. There was nearly always a feeling of malaise and depression after the experiments.

Free nitrites could be demonstrated in the urine within one hour after exposure to the fumes. No other changes were noted.

I was able to make one observation of the conjoined action of alcohol and powder fumes. One day one of the men presented himself slightly under the influence of liquor. The results of the experiment are interesting. The amount of powder exploded was 25 grams. The effect on the pulse was very pronounced. (Chart 7.) The stimulating effect of the alcohol, however, lessened the loss of vasomotor tone. The points marked 2 and 3 on the chart show the effect of exercise, and it will be noted that with the rise of the pulse rate the blood pressure also rose, in contrast to the effect shown in Chart 4. No tendency to dicrotism was observed.

Similar symptoms to these here recorded in the present experiments, have been observed in workmen engaged in the manufacture of smokeless powders. They are produced not only from the fumes arising from the powders, but also by handling the finished or unfinished product. Key[2] states that "nitroglycerin headache" is caused "either by inhalation of nitroglycerin vapor or by absorption through the skin, so that it results from handling the manufactured compound as well as from being present in a building in which the hot explosive is deposited. No one can enter a cordite drying room or 'stove' without experiencing a peculiar sensation at the heart and at the back of the head, which, in the absence of fresh air, soon develops into a headache which reduces to insignificance all the other ills of life." This effect is so well known that the occupation commands higher wages, not because of its perilous nature, but rather on account of the inconvenience from this source to which the men are subjected.

In nearly all the men used in the experiments a degree of tolerance was gradually established to the powder fumes. This is also a common observation among those engaged in powder-making. On this point Key[2] says: "Some suffer more than others, and on most people the fumes appear to lose their effect after a few days. With certain individuals, on the other hand, it is a matter of weeks before they become inured, and during that period they are never free from sickness and headache; moreover, a very few days' absence from contact with the explosive causes a return of the original susceptibility."

Among the men used in these experiments one was found who was practically unaffected by exposure to the powder fumes. The only effect observed was a fall of about ten beats in the pulse rate after exposure to dense fumes. The blood pressure was practically unchanged. This man had previously served in the infantry, and stated that he had inhaled powder fumes a number of times, during constant heavy firing, but he had never experienced any after-effects, although the other men about him had noticed the "powder headache." He was given nitrite of amyl by inhalation, and showed a very faint response to it. He gave practically no response to hypodermic injections of nitroglycerin gr. 1/100. This man represents an infrequent group, who are strangely resistant to the effects of the nitrites. I saw such another case in the clinic of the late Professor DaCosta. This was a man who had been given nitroglycerin to take by the mouth, with instruction to increase the dose to the point of tolerance. He returned, saying that he had taken large doses of the drug, and that he could see no effect of any kind. The drug was then pushed until he was taking, several times daily, the tremendous dose of 650 drops of the *spiritus glonoini*. I saw him take a dose of this size, in the clinic, and it had only a transient effect on his pulse.

Now the question arises, What gas or gases evolved from smokeless powders cause these effects? Smokeless powders are, practically all, composed of varying proportions of nitroglycerin, gun cotton and nitro-

cellulose, to which are added small proportions of metallic nitrates or organic bodies like urea or vaselin to act as accelerators and deterrents.

The explosion of nitroglycerin is usually represented as follows: $2(C_3H_5O_3(NO_2)_3)$ exploded $= 6CO_2 + 5H_2O + 3N_2 + O$.

The disruption of trinitrocellulose is shown in this reaction: $2(C_6H_7O_5(NO_2)_3)$ exploded $= 7H_2O + 9CO + 3CO_2 + 3N_2$.

Gun cotton is simply a highly nitrated nitrocellulose, containing more than 12.9 per cent. of nitrogen. Its explosion formula is considered to be the same as nitrocellulose.

The varying proportion of these ingredients in the principal smokeless powders is shown in the following table, which is taken from artillery notes No. 16 (12).

TABULATED CLASSIFICATION OF POWDERS.

PURE COLLOIDS.

ACETONE.

Maxim Schupphauss No. 1.
G. C. .....80.
N. C. 19.5
Urea 0.5
Powder B. (Vieille).
G. C. 68.21
N. C. 29.79
Paraffin ..... 2.
Rifleite.
G. C. 74.16
N. C. 22.48
Volatiles ..... .84
$C_6H_4(NH_4)$ 2.52
Swiss Normal Powder.
G. C. 96.21
N. C. 1.80
Resin 1.99

ETHER-ALCOHOL.

Pyrocollodion (Mendeleef's Powder).
$C_{30}H_{38}O_{25}(NO_2)_{12}$.
Powder for U. S. Army.
Nitrocellulose containing not less than 12.65 per cent. ± .05 per cent. of N.
Powder for U. S. Navy.
Nitrocellulose containing from 12.4 to 12.8 per cent. of nitrogen.

ACCELERATED COLLOIDS.

METALLIC NITRATE ACCELERATORS.

Plastomenti.
N. C. 67.18
(N= 12.33.)
$Ba(NO_3)_2$ 9.76
Toluene-di-nitrate 22.06
Powder BN.
G. C. 38.67
N. C. 33.23
$Ba(NO_3)_2$ 18.74
KNO_3 ..... 4.54
Na_2CO_3 ..... 3.65
Volatile 1.29
Schultze.
G. C. 32.65
N. C. 27.71
Cellulose 1.63
Ba $(NO_3)_2$ 27.62
KNO_3 ..... 2.47
$NaNO_3$ 2.24
Paraffin 4.2
Volatile 1.48
Troisdorf.
G. C. .....
N. C. .....
$-NO_3$ .....
U. S. Naval (small arms).
N. C. .....80.
Ba $(NO_3)_2$ .....15.
KNO_3 ..... 4.
$Ca(NO_3)_2$ ..... 1.
U. S. Army (small arms).
G. C. .....
N. G. .....
N. C. .....
$-NO_3$ .....
Deterrent .....
Indurite.
G. C. .....40.
Nitrobenzin .....60.

NITROGLYCERIN ACCELERATORS.

Ballistite.
G. C. .....50.
N. G. .....49.
Diphenylamin ..... 1.
Cordite.
G. C. .....37.
N. G. .....58.
Vaselin ..... 5.
Leonard.
G. C. .....24.
N. G. .....70.
Lycopodium ..... 4.
Urea ..... 2.
Maxim-Schupphaus No. 2.
G. C. .....80.
N. C. .....10.
N. G. ..... 9.
Urea ..... 1.
Peyton (California).
G. C. .....40.
N. G. .....38.
? ? ? .....
W. A. (Aspinwall-Whistler).
G. C. .....
N. G. .....
$-NO_3$ .....
Wetteren.
G. C. .....
N. G. .....

According to the formulæ given, nitroglycerin gives off no fumes that could be noxious or that could produce the symptoms that have been detailed. Gun cotton, however, and nitrocellulose give off large quantities of CO. The former yields on detonation amounts of carbonic oxid equivalent to from 28 to 45 per cent., depending on the pressure under which it is exploded. Reference will be made to the effects of carbonic oxid, and it will be seen that many of the symptoms produced are undoubtedly due to this gas. But there must be some other factor at work to produce the marked vasomotor and cardiac phenomena. This agent is nitric peroxid, NO_2. The formulæ given presuppose the complete and perfect detonation of the powder. Now detonation does not take place in military, sporting or blasting explosives. Instead, the action is a combustion, more or less rapid, according to the special use for which the powder is intended. The checking of the rate of explosion, by which it becomes more or less rapid combustion, is effected by means of deterrents. These deterrent bodies, or rather their effects, are of the greatest interest in this study. For this purpose most varied substances have been employed as urea, paraffin, resin, toluene, vaselin, lycopodium and the metallic nitrates. Many of them are unknown, and constitute the "secret" in most of the special powders. Now, under the influence of these "holders back," when smokeless powders burn instead of detonating, in addition to and replacing some of the products as given in the theoretical formulæ, the oxids of N appear. And they are developed in proportion to the slowness of the combustion. Hence slow-burning blasting powders which depend rather on the quantities of gas produced, than on the initial violence of the explosive blow for their disruptive effect, will produce large quantities of the oxids of nitrogen. It has long been known that when any of these powders burn quietly in the open air, still greater proportions of these compounds are formed. On this point Key[2] says the following: "If, however, nitroglycerin be decomposed by simple combustion, not detonation, the nitrogen and oxygen in the NO_2 molecules do not appear to be dissevered, the result being that not only are highly poisonous nitrous fumes given off, but the proportion of available oxygen is also so much diminished that a considerable quantity of CO is formed. Many instances are recorded of fatalities due to the inhalation of these nitrous fumes. In the cases where death has resulted from breathing nitrous fumes only, the end has generally been deferred for some time, amounting in one instance to no less than forty hours after the inhalation." Haldane[1] makes the following observation on burning explosives: "The most serious accidents in mines from gases from explosives have been due to the accidental burning of high explosives, such as dynamite or gun cotton. When substances of this class burn quietly instead of detonating, nearly the whole of the nitrogen is given off as nitric oxid (NO), instead of as free nitrogen. The nitric oxid at once combines with the oxygen of the air to form nitric peroxid, which is a very dangerous gas. Even when a charge is detonated for blasting purposes, it may happen, particularly with badly or roughly handled explosives, that part burns quietly and forms nitric peroxid. The latter is an irritant gas, but when sufficiently diluted may be breathed for some time without the person exposed to it being aware of the danger."*

* Since this paper was written I have received the "Report of the Surgeon General of the Navy for the Year 1904." It contains (page 230) a report by J. F. Urie, surgeon U. S. Navy, on the powder explosion and fire on the U. S. S. *Missouri*, April 13, 1904. It will be remembered that in this disaster out of 36 people directly exposed to the flame of the burning powder, 32 perished. One charge of 360 pounds of smokeless powder was ignited in a turret and two charges of the same weight each in the handling room. The following remarks of Surgeon Urie are particularly germane to this paper: "The gases generated by the combustion of 720 pounds of smokeless powder in the handling room permeated the different parts of the ship in its vicinity and was a source of danger to those fighting the fire and rescuing the victims. The composition of these gases has not been fully determined. A number of officers and men were variously affected by inhalation of the gases. An exhilaration was experienced at first, followed in a few cases by a partial loss of consciousness. This was probably the effect of the absorption of the compounds of nitrogen—nitrites and nitrous acid. Other effects of the inhalation of the products of combustion were those caused by the irritative action of gases on the lining of the respiratory tract. Two cases of pulmonary edema resulted, 1 proving fatal, and 8 others were severely affected. A large number of the officers and men were affected to the extent of experiencing a soreness of the trachea and bronchi and a slight distress in breathing."

It is apparent, then, that the gases producing the ill effects described are either carbonic oxid or nitric peroxid, or a combination of the two. An interesting study might be made in separating these two gases from smokeless-powder fumes and studying their effects separately. There is only one explosive that might facilitate this. Sir F. Abel states that "tonite" produces "little or no CO" in its combustion. Unfortunately, I could procure none of this particular explosive for study.

The symptoms of CO poisoning have been thoroughly studied by Haldane.[7] He made experiments on himself with carefully measured quantities of carbon monoxid gas. I have here extracted the salient facts of three of his experiments. For further data I must refer the reader to his splendid paper in the original.

Experiment 2.—Proportion of CO = 0.39 per cent. was inspired for 11½ minutes.

After 22 minutes: There was slight palpitation, pulse 102.

After 26 minutes: Hyperpnea, palpitation, pulse 120.

After 30½ minutes: Became giddy, much palpitation, out of breath and could not see well; singing in ears.

Experiment 6.—Proportion of CO = 0.12 per cent. inspired for 120 minutes.

After 15 minutes: Pink tinge in blood discernible.

After 37 minutes: Palpitation, pulse 96.

After 67 minutes: Slight palpitation; feel rather sleepy.

After 90 minutes: Moderate exercise caused distinct dimness of vision and hearing and a tendency to stagger.

After 120 minutes: On running up stairs once, became distinctly weak in the legs and had to lean against a table. Distinct impairment of vision and hearing and mental confusion.

After 138 minutes: Distinct throbbing headache, which lasted for two hours, with dimness of vision.

Experiment 7.—Proportion of CO = 0.21 per cent.; duration of inhalation, 71½ minutes.

After 34 minutes: Feeling of fullness and throbbing in head.

After 37 minutes: Fullness and throbbing more distinct.

After 45 minutes: Pulse 104, breathing distinctly deeper.

After 59 minutes: Beginning to look pale and yellowish.

After 63 minutes: Felt worse after making any movement in chair.

After 65 minutes: Hyperpnea marked, slight mental confusion.

After 71 minutes: Vision dim, limbs weak, gas stopped.

After 73 minutes: Could walk fairly straight across room; could not form letters on board as well as usual; confused.

After 77 minutes: After walking four times across room, staggered and nearly fell; vision impaired.

After 84 minutes: Attempted to walk along line of one of the boards of floor; did so with much difficulty and much staggering and waving of arms.

During the whole of the evening following this experiment, suffered from headache without nausea or loss of appetite; and during succeeding day, suffered from slight headache.

In these experiments it will be noted that the symptoms were developed slowly. Palpitation only occurs in from fifteen to thirty-five minutes. Acceleration of the pulse comes slowly and is not pronounced excepting in Experiment 2. Yet all the symptoms correspond very closely to the later phenomena observed in my series of experiments. This is because carbonic oxid is a cumulative poison. It produces no effect until a certain degree of saturation of the blood has occurred and a given percentage of the hemoglobin has been reduced. Haldane says: "Distinct symptoms appreciable during rest are not produced by carbonic oxid in otherwise normal air until about .05 per cent. of the gas is present; with about .2 per cent. urgent symptoms are produced." The symptoms depending on the extent to which the hemoglobin is saturated.

The presence of carbonic oxid in the gases of combustion was determined by the hemoglobin reduction test and spectroscopic examination. The test used was Vogel's. One part of blood is mixed with 100 parts of water. To this mixture ammonium sulphid is added to reduce any oxyhemaglobin. If the mixture is now examined with the spectroscope, carbonic oxid is shown by the presence of the double absorption band of reduced hemoglobin in the spectrum. This test was not found to be sufficiently delicate when applied to the blood of the men taking part in the experiment. Positive results were, however, obtained by Haldane's test.[8] A drop of blood is diluted with about 100 times its volume of water; for purposes of comparison a solution of about the same depth of color is prepared from normal blood. Part of this normal solution is saturated with coal gas which alters the color from yellow to pink. The three solutions are then poured into narrow test-tubes of equal diameter and compared. If the depth of color of the first solution now appears to be greater than, or less than, that of the other two solutions, water or blood must be added (to the first solution) until equality is established. The tints of the three solutions are now compared. According to the percentage saturation of the sample of blood under examination, the tint of the first solution will approach to that of the normal blood, or the blood saturated with coal-gas, and thus a rough estimation may be made of the percentage of saturation. This test is much simpler and much more delicate than with the spectroscope, but can not be carried out in artificial light. "In undiluted blood examined in bulk, the peculiar tint, due to the presence of carbon monoxid, can hardly be recognized." I modified the test by making a series of standard colors and comparing the blood to be tested on white filter paper in the same manner as hemoglobin estimations are made with the Tallqvist scale, and found this method to be easy and rapid.

The presence of NO_2 in the fumes of the powders is evidenced by the acrid, reddish fumes so irritating to the fauces and conjunctivæ. Chemically, it could be demonstrated, by the copper, spongy-platinum test, to be present constantly. Its absorption into the body was shown by the constant occurrence of free nitrites in the urine. Nitric peroxid in large doses and prolonged exposure cause fatal pulmonary irritation. In small doses it produces the same effects as any of the nitrite compounds. In fact, the latest theory of the action of the nitrites is that they break up into this gas in the body. Knott[9] gives the following formulæ: $C_5H_{11}NO_2+H_2O=C_5H_{11}OH+HNO_2$. Amyl nitrite, water, amyl alcohol, nitrous acid.

The nitrous acid thus produced rapidly undergoes full oxidation: $3HNO_2=HNO_3+H_2O+2NO$.

The oxid of nitrogen so formed instantaneously exerts its well-known affinity for oxygen: $NO+O=NO_2$.

So that we have, then, apparently the identical factor of NO_2 to deal with in each case as the active agent.

Ultimately the NO_2 or the "nitrites convert the hemoglobin of the blood, not simply into methemoglobin, as commonly assumed, but into what appears to be a mixture of methemoglobin and nitric-oxid hemoglobin.

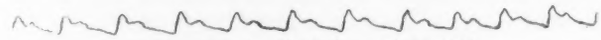
8. John Haldane: Report to the Secretary of State for the Home Department on the Causes of Death in Colliery Explosions and Underground Fires, London, 1896.

9. John Knott: Angina Pectoris, American Medicine, Oct. 29, 1904.

The color and spectroscopic appearance of this mixture are quite distinct from those of ordinary methemoglobin. Amyl nitrite in excess causes further changes, a body apparently identical with photohemoglobin being formed."[10]

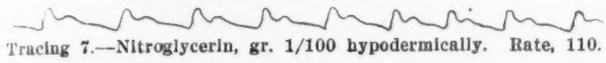
The similarity of the action of the nitrites and the fumes of smokeless powders is graphically shown in the appended tracings, Nos. 4, 5, 6 and 7. These represent the normal pulse of the man in No. 4; the pulse one minute after the inhalation of 5 minims of amyl nitrate in No. 5; the pulse after ten miutes' exposure to the fumes from 30 grams of smokeless powder, exploded, in No. 6, and the pulse five minutes after hypodermatic injection of 1/100 grain of nitroglycerin in No. 7. They differ in degree only, and in the rapidity with which the effect is produced. I believe the slower action with the powder is attributable, possibly, to an inhibitive effect of the carbonic oxid.

Tracing 4.—Normal rate, 70.



Tracing 5.—Amyl nitrite. Rate, 115.

Tracing 6.—Powder fumes. Rate, 112.



Tracing 7.—Nitroglycerin, gr. 1/100 hypodermically. Rate, 110.

Lyddite was not investigated. When first introduced it was supposed to have tremendous and widespread suffocative effects. These suppositions have not been borne out in actual experience. Lyddite $C_6H_2(NO_2)_3OH$, trinitrophenol, picric acid, on detonation yields large quantities of carbonic oxid and free carbon. It is likely that any suffocative effect it might possess would be due to the carbonic acid.

Another explosive with marked toxic properties, both in its fumes and on handling, is dinitrobenzene. Oliver[1] reports that 400 milligrams of lanolin containing 0.1 gram of dinitrobenzene rubbed into the groins of a man, produced lividity, cyanosis, and other pathognomonic symptoms in a few hours. Ten minutes' exposure to the fumes evolved in its manufacture has resulted fatally. The symptoms of acute poisoning are[1] nausea, vomiting, congestive headache, faintness and giddiness, loss of control over the limbs, numbness and tinglings. Deep cyanosis is characteristic. Pulse quick, weak, rate of 120, with very low arterial tension. The temperature ranges from 99° to 102° F. The urine may be dark and may contain free dinitrobenzene or nitrates and nitrites. I have had no opportunity to study this explosive.

I have seen what I believe to be a practical application of this question in ordinary city life. Of course, in mining communities it comes up all the time. In Philadelphia, in 1903, on the Fourth of July, vast quantities of cannon crackers were exploded. The day was muggy and close, and in some of the closely built streets the powder fumes lay thick and heavy. The sweetish, acrid, irritating odor of dynamite powders was unmistakable. On that day and the following day, I saw numerous cases of typical "dynamite headache." In two other cases I saw severe intoxications which, I believe, were due to nitrite poisoning. One of these cases I saw with Dr. J. L. Salinger. The patient was a child of 2 years. It was collapsed, stupid, slightly cyanotic, the forehead covered with cold sweat, the pupils dilated, and with a rapid, disordered and barely palpable pulse. There was also diarrhea. After thorough examination we came to the conclusion that the child was suffering from poisoning from the fumes of the cannon crackers. Afterward we learned that, in the immediate vicinity of its dwelling, in a rather narrow, closely built street, there had been an unusually heavy display.

The treatment of powder poisoning must be directed to the dual condition, the nitrite poisoning and the carbonic-oxid poisoning. The former must be met with remedies to restore vasomotor tone. Strychnin in full doses is indicated. Ergotin has been recommended. In moderate cases, the elimination of the carbonic oxid from the blood will proceed rapidly and certainly. In the more profound intoxications oxygen inhalations are indicated, and artificial respiration as long as there is any embarrassment of respiration, the idea here being to establish a degree of hyperoxygenation and to permit mechanical solution of the oxygen where an appreciable amount of hemoglobin is so reduced by the carbonic acid as to exclude it as an oxygen carrier. For the control of the "dynamite headache" the ordinary coal-tar products are not only useless, but dangerous when the heart and vasomotor system are profoundly affected. The coal-tar products seem to have no influence whatever on this headache. The best remedy is that advised by Key,[2] "strong coffee and a linseed poultice to the back of the neck."

These studies show that:

1. The explosion of smokeless powders produces gases which, under some circumstances, may lead to profound intoxication or death.

2. The gases are nitrogen peroxid and carbonic oxid.

3. The symptoms produced are attributable to inhalation of both of these gases.

My thanks are due to Col. S. E. Tillman, professor of chemistry at the U. S. Military Academy, West Point, for valuable aid in some of the chemical problems involved, and to Sergeant, First class, Jean Clare, Hospital Corps, U. S. Army, for assistance in most of the experiments.[11]

10. Haldane, Makgill and Mavrogordato: The Action of Nitrites and Physiologically Allied Substances, Proceedings Physiological Society, Nov. 14, 1896; Journal of Physiology, 1896.

11. Other references which may be consulted are: M. Eissler: Handbook of Modern Explosives. Bernadou: Smokeless Powders. Cundill: Dictionary of Explosives. Walke: Lectures on Explosives. Weaver: Notes on Explosives, Bulletin No. 16 of the United States Artillery School, 1904. Guttman: The Manufacture of Explosives. Berthelot, translated by Hake and Macnat: Explosives and Their Power.

LOCAL ANESTHESIA

BY INJECTIONS OF STERILE WATER.

FRANK W. STEVENS, M.D.

BRIDGEPORT, CONN.

The subcutaneous injection of water for the relief of non-operative pain was suggested as early as 1868, and since then local anesthesia has been successfully produced by injecting solutions of various drugs into the skin and subcutaneous tissues.

In 1901, Dr. Samuel G. Gant of New York began his experiments with sterile water and has demonstrated that local anesthesia can be obtained quickly by injecting into the skin, mucosa and deeper structures

sufficient water to produce a glassy appearance of these tissues; the anesthesia being due, apparently, to the pressure on the terminal nerve filaments. His results were so satisfactory that he now employs it to the exclusion of general and medicinal local anesthesias in most of his rectal operations. Using Dr. Gant's technic, as given below, I have successfully employed sterile water for the production of local anesthesia in the following operations: One exploratory laparotomy, thirty-nine operations for hemorrhoids, three for fistula in ano, two for fissure in ano, three for sebaceous cysts and three for varicose veins of the leg.

The method of producing water anesthesia is very simple. The only requirements are warm sterile water and a hypodermic syringe fitted with a long fine needle.

The temperature of the water is unimportant in producing anesthesia, but warm water causes less discomfort than hot or cold. After thoroughly sterilizing the syringe, needle and skin, the anesthesia is produced in the following manner:

The skin along the line of incision is first anesthetized. This is accomplished by using a very fine needle and by introducing it into (not under) the skin almost parallel to the surface. If the skin is compressed for a few seconds between the thumb and forefinger at the point of insertion, the momentary pain caused by the prick of the needle and the first injection is diminished and often prevented.

A few drops of water are slowly injected, causing a slight wheal to appear, which is absolutely without sensation. The point of the needle is pushed further under the skin through this area of insensibility, and a few drops of water are again injected. Another wheal arises close to the first, and by extending these injections farther and farther the whole line of incision is distended and rendered anesthetic.

When the syringe is empty, it is withdrawn, refilled and the needle reintroduced within the anesthetized area and the injections are repeated as before. After the skin has been anesthetized, the needle is pushed through this distended line into the subcutaneous tissue and injections are made until a firm whitish, ridge-like swelling, about as wide and thick as the index finger, is produced. These deep injections may cause a temporary discomfort due to the rapid distension of the subcutaneous tissues.

If the procedure has been properly carried out, the skin and underlying tissue can now be incised, and, in almost every instance, without pain. The following are some of the advantages of water anesthesia: 1. Effective local anesthesia is quickly and easily produced. 2. No elaborate preparations are necessary. The only requirements are an ordinary hypodermic syringe fitted with a suitable needle and warm sterile water. 3. There are no toxic effects. 4. No nausea, vomiting nor straining follows its use. 5. It can be used in heart, lung or kidney complications without danger. 6. There is no pain following the operation as is often the case after cocain, freezing, etc. 7. Its value in an emergency when general and medicinal anesthetics are not at hand.

On Feb. 27, 1904, water anesthesia was used for an exploratory laparotomy at the Bridgeport Hospital by Dr. Garlick and myself with the following results:

1. The abdomen was opened without pain. 2. Careful handling of the viscera caused no pain. 3. Traction on the mesentery caused pain. 4. Ruptured tubal pregnancy was found and the necessary traction in attempts to bring out the ovary and tube caused pain. As haste was necessary, due to profuse hemorrhage, ether was administered to complete the operation.

In operating for hemorrhoids, it is only necessary in the external thrombotic tumors to anesthetize the skin over the clot which can easily be turned out after the incision is made. For external cutaneous hemorrhoids both the skin and tumor should be distended tightly to produce anesthesia. In operations for internal venous hemorrhoids, the injection is made into the center of the tumor until it is distended tightly and turns white, when it can be removed painlessly by the ligature method.

The advantages of water anesthesia in hemorrhoid operations are: 1. No preliminary preparations are necessary. 2. No dilation of the sphincter is necessary. 3. The operation may be performed either in the office or at the patient's home. 4. The patient is able to continue at his business without loss of time. 5. There is no pain nor bleeding following the operation. 6. There is no danger to heart, lungs or kidneys.

In operations for fistula in ano, the skin and subcutaneous tissue up to the anal margin should be distended and in some cases the mucosa, submucosa and external and internal sphincters have to be infiltrated. In operating for sebaceous cysts, the skin overlying the cyst is first anesthetized and then the needle is plunged between the skin and the cyst wall; as the water is injected it separates the skin from the cyst wall and allows the adhesions, if present, to be cut without injuring the sack. In operating for varicose veins, the skin and subcutaneous tissues are distended and the veins ligated.

In conclusion, I would recommend that water anesthesia be given a thorough trial. Failure at first attempts should not condemn its use for practice will soon enable one to distinguish the proper amount of distensions necessary to produce the anesthesia. I feel sure that when this method has become more familiar, the advantages will be so apparent that its use will soon become general.

Special Article

IMMUNITY.

CHAPTER XIV.

AMBOCEPTORS AND COMPLEMENTS.

Experimental Value of Hemolysins.

The simplicity of hemolytic experiments and the rapidity with which they may be performed and terminated have rendered hemolytic serums particularly useful in the study of amboceptors and of complements, for we are to understand that such serums are toxic to erythrocytes only because of the amboceptors and complements which they contain. All the most important facts which have been learned concerning the action of hemolytic serums have been found to hold true for bactericidal serums as well; hence it is an indifferent matter if principles which are common to both are illustrated by frequent references to serum-hemolysins.

Technic of Hemolytic Experiment.

The corpuscles for such experiments are obtained by the defibrination of freshly-drawn blood and the removal of the fibrin. Usually they are made into a 5 per cent. suspension by dilution with isotonic (physiologic) salt solution. Inasmuch as the serum which is present may interfere with the action of the complement or amboceptors of the hemolysin, it is customary to remove it by the so-called washing process. The 5 per cent. emulsion, or the undiluted blood, is centrifugated, the overlying fluid drawn off by means of a pipette and substituted by fresh salt solution;

the corpuscles are thoroughly mixed with the new solution and the process of centrifugation repeated. After from two to four washings any residual serum usually may be disregarded. To test the hemolytic power of a serum one measures identical quantities of the 5 per cent. washed blood into each of a series of test-tubes by means of a graduated pipette and then adds increasing quantities of the serum to succeeding tubes. All tubes are then diluted to equal volumes by means of salt solution, as it is of some importance to maintain a uniform concentration of the corpuscles. The contents of the tubes are mixed evenly by shaking and the series is placed in the thermostat for about two hours; this temperature is necessary for complete and rapid action of the toxic substances. At the end of this time the tubes are placed in the ice chest and left over night in order that the cells may settle to the bottom; or, sedimentation may be accomplished at once by centrifugation.

In either case, the overlying fluid is colored red by the dissolved hemoglobin in proportion to the extent of destruction of the erythrocytes. In case solution has been complete, the sediment is indistinct and colorless, being made up only of the stromata of cells, whereas in the tubes showing only partial hemolysis the sediment is red and has an indirect quantitative ratio to the coloration of the overlying fluid. By suitable variations in the amounts of serum used, in different tubes, its exact dissolving dose for the given volume of corpuscles may be determined. Although the term hemolysis is a perfectly proper one, we are to understand that serums cause solution of the hemoglobin but not solution of the whole cell; we speak loosely of solution of the corpuscles.

Hemolysis.

After Bordet had shown the analogy between bactericidal and hemolytic serums, and after the phenomena of inactivation and reactivation had been developed by Bordet and Metchnikoff, Ehrlich and Morgenroth undertook the study of amboceptors and complements as they occur in hemolytic serums. The facts ascertained by them and the methods of research which they devised have provided many investigators with a starting point for work of the highest importance concerning the bactericidal serums and antibacterial immunity, and their interpretations, moreover, served to extend the side-chain theory of immunity to its present comprehensive limits.

Similarity Between Bactericidal and Hemolytic Action.

For the sake of convenience one may speak of a heated immune serum, or one in which the complement has become inactive from age, as a solution of amboceptors, disregarding temporarily the agglutinins, precipitins and perhaps other bodies which the serum contains. Also, since fresh normal serums are rich in complements and usually contain but a small amount of any one amboceptor, they may conveniently be considered as solutions of complements; yet normal serums may not be considered as pure complement and used as such in unlimited quantities for actual experiments, because of the bacteriolysins and hemolysins which many contain. Only a quantity of the normal serum (which in itself is not toxic for the cell) may be used for complementing purposes; this may be as low as, or lower than, 0.1 c.c. for a particular experiment.

Solutions of Amboceptors and Complements.

As pointed out in the preceding chapter, the combined action of amboceptor and complement is necessary for the cytotoxic action of a serum. In view of the fact that the toxic power is lost by exposure to that temperature which destroys complement, it seems that the latter is the actual dissolving or toxic substance, whereas the amboceptor must play some intermediary rôle. Investigations have shown that the two act together in a very definite manner in that the absorption of the amboceptors by the cells is a prerequisite for the absorption and action of the complement. This may be verified by simple experiments. Mix erythrocytes with the homologous amboceptors, and after a period of from twenty to thirty minutes centrifugate the mixture and remove all the free serum from the cells by repeated washings with isotonic salt solution. If the cells are again suspended in salt solution and a small amount of complement is added and thoroughly mixed, the hemoglobin is dissolved out; a control must, of course, show that the complement alone has not the dissolving power. The result indicates that the erythrocytes during their contact with the immune serum had absorbed or combined chemically with the amboceptors, and that the latter remained attached to the cells in spite of the washings to which they were submitted.

The Absorption of Amboceptors by Cells.

It would seem that the union of amboceptor with cell has the effect of rendering the latter susceptible to the action of complement, and for this reason amboceptor-laden cells are spoken of as sensitized cells. Hence, according to the cells and serums employed, we may refer to sensitized erythrocytes, sensitized bacteria, etc. The experiment is called the sensitizing, absorption or binding experiment. An immune serum may be deprived of all its amboceptors in the binding experiment if a sufficient quantity of cells has been used, and it would thereby be rendered incapable of further reactivation by the subsequent addition of complement.

Sensitization.

If, instead of performing the experiment in the manner described, the process is reversed so that the corpuscles are first treated with the solution of complement and then with the amboceptors, the corpuscles are not hemolyzed. During the washing process the complement is entirely separated from the cells, and from this fact it is clear that direct union between corpuscle and complement does not occur; only sensitized cells take up complement.

Order of Action of Amboceptor and Complement.

The question as to whether the corpuscles in taking up amboceptors do so by chemical combination or by physical absorption has been contended with some vigor. Ehrlich believes that the process is one of chemical union, and if one adheres to this view it becomes necessary to assign binding or haptophorous groups both to the red blood cells and to the amboceptors. In contrast to another haptophore which the amboceptor possesses and which will be described below, that one which unites with the cell is called the cytophilous haptophore. The haptophore of the erythrocyte which enters into the union is an essential part of a receptor of the red cell; consequently we say that the amboceptor unites with a receptor of the corpuscle.

The heating of serum to 56° C. provides one means of apparent isolation of the amboceptors from the complement, but this is not a true isolation in that complement is merely rendered inactive by the heat rather than totally eliminated.

Ehrlich and Morgenroth devised a method by which the amboceptors may be separated from a fresh immune serum without in any way injuring the complement. This is accomplished by performing the binding experiment already alluded to, at a low temperature. The serum, containing both amboceptors and complement, is cooled to 0° C. or slightly above, by means of a freezing mixture of salt and ice. A suspension of the homologous corpuscles is cooled to the same point, the serum is added and the mixture maintained at 0° to 4° C. for fifteen to twenty minutes. At the end of this time the sensitized cells are removed by immediate centrifugation at a low temperature, and are washed entirely free from serum by the use of ice-cold salt solution. If the low temperature has been adhered to rigorously and the work done quickly, the corpuscles are not laked during the manipulations in spite of the presence of both amboceptors and complement. Furthermore, the washed sensitized cells remain intact even when their temperature reaches that of the thermostat, whereas if some fresh normal serum or the serum from which the amboceptors were extracted is added, they undergo hemolysis as readily as when treated with the active immune serum. The original immune serum is now a solution of complement, and fresh corpuscles which are added to it are not dissolved because of the absence of amboceptors.

The Absorption Experiment in the Cold.

These results show the following important facts: Amboceptor and complement exist side by side in an immune serum, not as a united substance. Union of amboceptor with cell is independent of complement, the latter being taken up only after the amboceptor-cell reaction has occurred. Amboceptors unite with cells at a low temperature, whereas complement requires a higher temperature for its union and for the ferment-like activity by which it dissolves or kills the cells.

That constituent of amboceptor which unites with the cell has been referred to as the cytophilous haptophore. Ehrlich and his followers believe that complement in establishing connection with the cells does so by combining with a second haptophore of the amboceptor, after the latter has sensitized the erythrocyte or bacterium. Hence, amboceptor has, as the name implies, two receiving groups or haptophores, the second being the complementophilous haptophore (Fig. 7). It is hardly desirable to enter here on various experiments which furnish additional evidence of the amboceptor nature of the thermostabile body. The observed phenomena allow one to assign to it the two haptophores mentioned.

Complementophilous Haptophore of Amboceptor.

There is a conflict of ideas as to the nature of the change produced by the amboceptors, as a result of which the cells are made susceptible to the action of complement. Bordet speaks of the amboceptor as the substance sensibilisatrice, the sensitizing substance; and his conception of the action of the two substances he has compared roughly to the opening of a lock for which two keys are demanded. One key, amboceptor, is needed to prepare the lock for the action of the second key, complement, the latter really being the one which opens it.

Action of Amboceptors.

Metchnikoff applies the name fixator to the thermostabile body, having in mind the action of a mordant in preparing tissues or other substances for the reception of a dye; this differs little from preparator, the word used by Gruber.

The idea of Ehrlich, however, is distinctly at variance with the conceptions mentioned, for he sees in the union of amboceptor with cell nothing more than the introduction of a new chemical affinity, i. e., one which attracts complement, and this new affinity does not lie in the cell itself but rather in the amboceptor (complementophilous haptophore) after the union has occurred. Hence, the terms intermediary body (*Zwischenkörper*), copula of Müller, and desmon of London, are words which carry with them the meaning that the amboceptor first unites with the cell and then acts as a linking substance through which complement finally is put in relation to the cell. This also is the meaning embodied in the amboceptor of Ehrlich, the word indicating more accurately his conception of the method by which the substance acts as an intermediary body.

If we consider it established that in the process of cytolysis union occurs between complement and amboceptor we must at the same time assign a haptophorous group to complement. Union would be impossible without it. Corroborative proof of the existence of this haptophore lies in the fact that immunization with complement results in the formation of anticomplement, a prerequisite for which is union of complement with cell receptors in the immunized animal; and this union, it seems necessary to assume, takes place through a binding group. The mere possession of a haptophore, however, does not account for the ferment-like activity of complement. The latter characteristic resides in the so-called zymotoxic group; hence, complement, having a binding and a toxic group, has a structure like that of a toxin.

Structure of Complement.

Somewhat loosely we have said that the inactivity of a serum which has been heated to 56° C. depends on destruction of the complement. This is not strictly true, however, for such treatment destroys only the zymotoxic group, the haptophorous constituent remaining uninjured. Complement altered in this respect is called complementoid, and it is analogous to toxoid, agglutinoid and precipitoid. Two essential facts go to show that this is the essential change wrought by heating. First, immunization with complementoid, heated complement, causes the formation of anticomplement, which could not occur except for the retention of the haptophore. Second, complementoid may exceed true complement in its affinity for the amboceptor, and if sensitized cells are treated with a serum containing a mixture of complement and complementoid, the latter may occupy completely the complementophilous haptophores of the amboceptors and thus may block the way for action on the part of complement. This is again the specific inhibition which has been mentioned in connection with toxoids, agglutinoids and precipitoids. This is the *Complementoid-Verstöpfung* of Ehrlich.

Complementoid.

The amboceptor, as the characteristic property of a bactericidal or of a hemolytic serum, is a specific product of the immunization, whereas the amount and character of complement in the immunized animal undergoes little or no change. We are, of course, obliged to consider the amboceptors as a product of the cells of the body. In the terminology of Ehrlich, they are discarded cell receptors, and with their two haptophores represent a more complex structure than either the receptors of antitoxin or agglutinin; the latter are uniceptors; the former amboceptors, and because of their higher differentiation Ehrlich has called them receptors of the third order (Fig. 7).

Formation of Amboceptors.

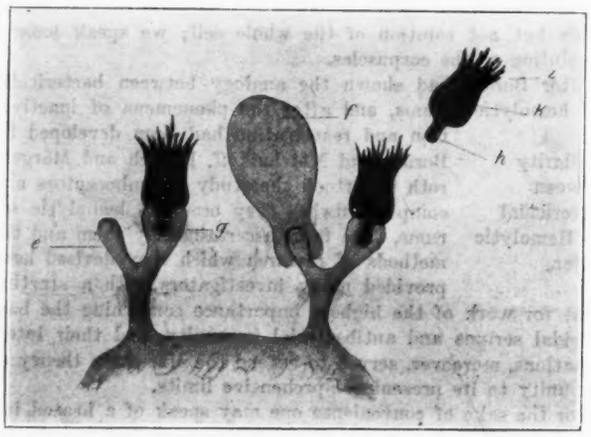


Fig. 7.—Graphic representation of receptors of the third order, and of some substance uniting with one of them. *c*, Cell receptor the third order, an amboceptor; *e*, one of the haptophores of the amboceptor, with which some food substance or product of bacterial disintegration, *f*, may unite; *g*, the other haptophore of the amboceptor with which complement may unite; *K*, complement; *h*, the haptophore, and *z*, the zymotoxic group of complement. From Ehrlich's "Schlussbetrachtungen," Nothnagel's System of Medicine, vol. viii.

When micro-organisms gain entrance to the body they are killed and dissolved in considerable masses. As a result of the solution, certain bacterial constituents reach the circulation, and among them are molecules or receptors which possess haptophores capable of uniting with a particular type of amboceptor, the latter being an integral part of some tissue cells. This union having taken place, an affinity for circulating complement may be created as in the test-tube experiments. We have thus the possibility of stimulation of the cell by the bacterial constituent itself as a toxic or unusual food substance, or the toxic action may be caused by products of disintegration of the bacterial substance, the disintegration having been accomplished by the digestive action of the complement which was taken up by the amboceptor. The effect is that of an unusual stimulation, in response to which the cell, if not fatally injured, reproduces many amboceptors corresponding to the type which was occupied or injured. As in the formation of other antibodies, the new-formed amboceptors reach the general fluids of the body.

Concerning the specificity of serum-hemolysins and serum-

bacteriolysins for their homologous cells, we, of course, refer to the specificity of the whole amboceptor-complement complex. It is necessary to throw the responsibility on both substances, because of the variations which exist among complements as well as among amboceptors. Inasmuch. however, as the heat-resistant body alone is increased during immunization or infection, the greater part of the specificity would seem to depend on the nature of the amboceptor rather than on that of complement. No theory except that of Ehrlich offers at present a tangible explanation of the feature under discussion.

Specificity of Bactericidal Amboceptors and Complements.

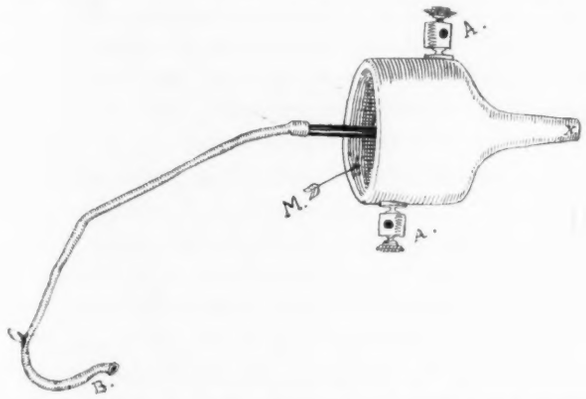
(To be continued.)

New Appliance

AN APPARATUS FOR APPLYING HEATED AIR TO THE EAR.

ALBERT C. HEATH, M.D.
ST. PAUL, MINN.

This appliance may be used with any cautery battery or motor for cautery use by attaching the cords (wire) which one ordinarily uses to the cautery handle. After making these connections the current is turned on, slowly at first, till the required amount of heat is obtained. Air is then forced through the rubber tube, either by means of compressed air (small pressure), hand bulb, or by blowing with the lips. If



Aural air heater. X, End of otoscope for insertion into external auditory canal. A, Binding post for attachment of end of cautery cord (wire). B, End of tubing through which the air passes that is to be heated. M, Open end of otoscope through which, by aid of illumination, the definite application of heated air to any part of the external canal or drum membrane may be observed.

the end (X) is put very near the operator's cheek or in his ear, he can find out the temperature of the heated air. This may be increased or decreased at pleasure, by means of the rheostat connected with the cautery battery. I have found that almost one-half the amount of current necessary to light, so to speak, a large cautery nasal knife, will generate a considerable amount of heat. If the full strength of the cautery current is turned on at once it may melt the connections of the metal tube.

This appliance has the following advantages:

1. Prompt graduations of heated air by means of the rheostat.

2. The otoscope, with illumination, makes it possible to see what is being done and so makes the application more definite.

3. Lack of danger of burning the external canal, because no part of the instrument is any hotter than the heated air that is being utilized.

4. Simplicity of construction and operation.

5. It can be used in combination with pump massage, so to speak; when the alternate out and in strokes are used, each in stroke of the pump produces a gentle puff of heated air.

It is my custom to put the otoscope in the ear, with a very small amount of current turned on, and then to force air through the rubber tube and gradually, by means of the cautery rheostat, to increase the current and consequently the heat. I usually increase the heat to the point of toleration and keep it there for a greater or less period. I use a gentle blowing pressure and try not to force the air through too violently.

I am convinced that this heater makes the application of heated air a definite therapeutic procedure; the degree of heat being controlled, as well as the point of application being under the direct observation of the operator.

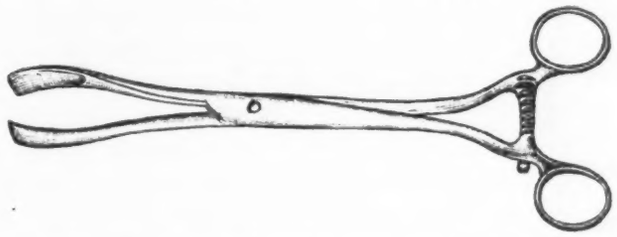
New Instrument

UTERINE ELEVATOR FORCEPS.

THOMAS S. CULLEN, M.B.
BALTIMORE.

When dealing with adhesions in the pelvis, it is often necessary to draw the uterus upward and forward so that the adhesions can be cut under guidance of the eye. Traction may be made by grasping the round ligament, the margin of the tube or the utero-ovarian ligament with artery forceps, but in inflammatory cases the tissue is peculiarly prone to tear and considerable bleeding is liable to follow if much traction be made. The uterus may be grasped with bullet forceps. These are apt to tear out if much traction be exerted, and, even if they do not, subsequent bleeding from the points where the instrument grasped the organ is a source of annoyance and several sutures are often required to check it.

About two years ago, I had forceps made that obviate most of these difficulties. One might very well speak of the instrument as a "cross" between obstetrical and artery forceps. The handles are those of a pair of artery forceps, the blades are



nearly an inch broad and viewed from the inner surface are concave from side to side and from above downward. In other words, they are so formed that they will accommodate themselves to the general contour of the uterus, and if tightly applied will hold the organ firmly. If the forceps be snugly applied to a thumb, it is impossible to withdraw it and yet at the same time no pain or unnecessary pressure need be felt. The forceps may be fenestrated if desired.

The traction forceps have the following disadvantages: 1. They sometimes slip off, especially if the uterus be infantile. 2. It sometimes requires both hands to apply them.

In the two years I have, on the whole, found them very satisfactory. Even when dealing with the large, boggy uteri, which bleed so readily, there has been no injury nor subsequent bleeding, save in one instance, where a slight abrasion occurred. Often in such uteri a depression fully 3 mm. is made by the forceps, but in a few minutes all trace of it has disappeared.

When suspension of the uterus is advisable the sutures can be easily placed through the fundus between the blades of the forceps.

Cultivation of Rubber in Ceylon.—The *Journal of Tropical Medicine* states that the cultivation of rubber is being taken up seriously in Ceylon. During October about 60,000 trees of the Para and Castillon varieties were planted in the island.

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THE ROUTES OF INVASION BY THE BACILLUS TUBERCULOSIS.

Just now the prominent question in the pathology of tuberculosis is the relative frequence of infection through food and through inhalation, the importance of bovine tuberculosis as a source of the disease in man being a part of the same problem. We are fairly familiar with the possible ways in which the body may be invaded, but in spite of the enormous material always at our disposal we have still failed to find a way to determine in just what manner each particular case has been infected; and this information is essential for the solution of the problem. Clinical observation can help but little, chiefly because of two factors: the long period of time that may separate the infection of the body and the development of symptoms, and the omnipresence of the tubercle bacilli. Hence, the source of infection of each case must nearly always be uncertain, however strongly a certain origin may be suspected; for example, if a patient develops tuberculosis after drinking milk from tuberculous cows, it is still possible that the disease as manifested may be the result of an infection received years before, and it is highly probable that the patient has been inhaling bacilli from various sources nearly every day.

Anatomic investigations are also inconclusive. Not long ago it was thought proper to consider the largest and most advanced area as the primary site of the infection, and the smaller areas as secondary, and many theories have developed on evidence of this sort, which is altogether worthless. Experimental inoculations have shown conclusively that the place first infected may show but a few minute tubercles, while more remote lesions have advanced to a large size. Another mistake was that of assuming that infection of the tissues must occur at the point where the bacilli entered the body, and that hence a food tuberculosis should show intestinal lesions, and that an inhalation tuberculosis should always start in the lungs. We now know, however, that the bacilli can penetrate the tissues without producing recognizable changes, and may infect first the regional lymph glands; they may even enter the blood directly through the thoracic duct and may produce the primary lesion in any part of the body. It is perfectly possible, therefore, to have a primary tuberculous meningitis, or synovitis, or osteomyelitis, with no other tuberculous lesion existing in any other part of the body; how often such is the case, however, is a question that is most difficult of solution.

New observations from Weichselbaum's laboratory have added difficulties, by showing the possibility of the latent existence of tubercle bacilli within the human body without the production of anatomic changes. The mesenteric, mediastinal, and cervical glands, and also the tonsils were taken from bodies of children dead from acute infections and free from all evidences of tuberculosis. Part of each gland was injected into a guinea-pig and part was studied microscopically. In a considerable number it was found that the glands contained virulent tubercle bacilli, as shown by the infection of the animals, although there were no microscopic evidences of tuberculosis. If tubercle bacilli can live in lymph glands without producing any lesions, it is easy to imagine them passing from gland to gland until they eventually lodge and produce the first tubercles at a point remote from the site of their entrance. Bartels and Spieler have obtained some similar results in a series of interesting experiments, in which they aimed at reproducing as nearly as possible the conditions under which human infections may occur. Guinea-pigs were kept in as normal circumstances as possible in the rooms occupied by consumptives, and they often developed tuberculosis, both of the lungs and of the mesenteric glands; here, also, it was possible in some cases to find tubercle bacilli when there were neither macroscopic nor microscopic lesions. When tubercle bacilli were fed to guinea-pigs, or when the bacilli were simply placed in their mouths, they often developed widespread tuberculosis without any lesions of the mucosa.

Evidently the occurrence of marked pulmonary lesions does not by any means prove that the infection is through inhalation, any more than a predominance of lesions in the mesenteric glands proves that the bacilli have been taken in with the food. There is no certain relation between the point of entrance of the infection and the point of development of the disease. Of great clinical interest in this connection is the possibility of apical tuberculosis of the lungs as a direct extension from the tonsils by way of the cervical lymphatic apparatus. M. Wassermann[1] has particularly urged this, believing that in many cases the bacilli enter the tonsils and pass along the cervical lymphatics (we have shown above that this can occur without the development of recognizable lesions in the lymph glands,) to the parietal pleura over the apex, producing here a pleuritis which involves the visceral pleura, and in turn the lung tissue. He cites cases which he thinks have originated in this way, one of the clinical characteristics being the occurrence of sharp pains under the clavicle and in the shoulder, before evidences of tuberculosis appear. In support of this theory may be mentioned

1. Berl. klin. Woch. Abstract in THE JOURNAL, page 76.

the extremely common occurrence of dense bands of adhesions between the two pleural surfaces at the apex, often associated with definite evidence of healed tuberculosis. It can hardly be denied that this is a possible route for infection, but, again the important and unsolved question is the relative frequence. Probably it is not the usual source of apex tuberculosis, for careful dissections have shown that this most frequently begins in a small branch of the posterior superior bronchiole, and not in the pleural surface.

THE RELATION OF THE HYPOPHYSIS CEREBRI TO ACROMEGALY.

There is no aspect of modern medicine more fascinating than that which deals with those glands which possess a so-called internal secretion. While the physiology of some of these structures is still incomplete, that of others is fairly clear, and the field is one in which pathologic lesions with the concurrent alterations in function may well serve as aids in clearing up obscure physiologic questions. In the case of the thyroid gland, and to a lesser extent in the case of the adrenals, physiology has been aided both by pathology and by experimentation, but in the case of the hypophysis cerebri experimentation is extremely difficult, on account of the anatomic situation of the gland, and we must rely largely on clinical and pathologic data to furnish us with physiologic facts.

The question of the function of the hypophysis cerebri or pituitary body has been investigated to some extent by observing the effect of the injection of extracts of the gland into animals. It can not be said that striking results have been obtained by this method. Substances which raise the blood pressure, and others which lower it, have been isolated, but in no case have lesions in any way resembling acromegaly or giantism been produced. Perhaps such results could hardly be expected if we accept the widely held view that acromegaly is due to a hypersecretion or to a changed secretion of the hypophysis. The disease is generally a chronic one, and it is likely that injection experiments would have to be carried on for months or even for years to imitate the effects of such a hypersecretion. As far as pathologic anatomy is concerned, one fact stands out in the recent studies of acromegaly, and that is the constant presence of some lesion of the hypophysis. While the majority of observers see a causal relation between the enlarged hypophysis and the acromegaly, a fair minority think that the enlargement is an effect and not a cause. This latter view is supported largely on account of the fact that there are a good many cases on record in which a tumor of the hypophysis existed without acromegaly. It is questionable whether this apparent disagreement with the hypersecretion theory of acromegaly can not be shown to be invalid in many, if not in most, of the reported cases of hypophyseal tumor without acromegaly.

Assuming, for the moment, that acromegaly is due to a hypersecretion of the hypophysis, how can we explain these cases of hypophysis tumor without acromegaly? A review of such cases shows at once that some of the so-called tumors are destructive inflammatory lesions, such as gummata or tubercles. In other cases, the growths are metastatic, and these tumors also necessarily destroy the gland substance. The same is true of spindle cell sarcomata and similar tumors which spring from the gland framework and destroy the more important structures. The difficulty arises when we attempt to explain the lack of acromegaly in cases with adenomata of the hypophysis, as this is the lesion most frequently found in latter years in this disease. In some instances, acromegaly is probably overlooked, for we know that there are cases, the so-called *fruste* form of the French, in which the ordinary lesions are very slight in degree. In other cases, the hypophyseal lesion may have occurred in individuals of advanced age.

Cestan and Halberstadt claim that acromegaly does not occur after the age when the periosteum ceases to have marked bone-forming tendencies. In some such cases there is evidence to show that excessive obesity may take the place of the ordinary lesions, a sort of vicarious acromegaly. On the other hand, it is difficult to explain true acromegaly resulting from primary sarcomata of the hypophysis, just as it is difficult to explain a lack of Addison's disease in primary new growths of the adrenals.

There is a good deal of evidence to show that in such cases the tumor cells may take on the function of the gland cells from which they originated. Such a thing has been observed in bile-forming liver tumors, for example. Whether the hypophyseal enlargement is secondary, as Kollavits[1] claims, or whether it is primary, as the majority of observers hold, is not yet satisfactorily settled and more work must be done before we can reach a definite conclusion.

EPIDEMIC CEREBROSPINAL MENINGITIS.

During the month of April and the last week in March the deaths from epidemic cerebrospinal meningitis in New York City have averaged over 100 a week, and toward the end of the month the fatality was rather on the increase than on the decrease. Over 1,000 deaths from the disease have occurred in New York City since the beginning of the present year. It is easy to understand, then, that every effort is justified in preventing any further spread. Accordingly, though the affection has not been proved to be contagious, the New York City Department of Health has announced that hereafter the disease must be reported and that every room in which it has occurred must be disinfected and every patient as carefully isolated as for any of the known virulently contagious diseases.

This does not determine the contagious nature of the

1. Deutsche Zeit. f. Nervenheilkunde, ol. xxviii. No. 1.

disease, but is only an extraordinary precaution adopted in order to try to meet a puzzling dilemma. In New York, so far, medical attendants on those suffering from the disease have not shown any special liability to contract the affection, but this can not be used as an argument against its contagiousness, since a physician in Philadelphia and one in New Haven caught the disease from patients and died. An argument, however, against the ordinary contagiousness of the disease is the fact that many physicians, in the treatment of the affection, have freely tapped the spinal canal and have removed quantities of pus containing the micro-organism that is considered to be causative. Even with the most careful precautions, some of this material has been sure to soil the hands of the operator, and very few physicians are without cutaneous lesions around the finger nails, especially during winter weather, through which, if the micro-organisms were likely to gain an entrance in this way, it would surely have obtained a foothold within the body; yet no such cases have been reported. The subject certainly needs much study. The affection has, however, at present a definite tendency to occur in the crowded portions of cities, and there is every justification for supreme precaution in order to prevent, if possible, its spread, or at least to test the efficacy of thorough disinfection.

In some fifty cases in different hospitals of New York City, diphtheria antitoxin has been used either subcutaneously or by injection into the spinal canal, but few who have watched the results consider that this remedy has produced any beneficial effect. In a smaller number of cases aseptic horse serum has been used in the same way, but with equally futile results. While in some cases the well-known anomalous course of the disease has seemed to justify the thought that some remedial measure, employed just before a change for the better began, was the causative factor in producing this change, larger experience has proved that all the remedial efforts during the present epidemic have added to the chaff and not to the grain of therapeutics. Unfortunately there comes with this the definite announcement that the disease is much more fatal than it was last year, the death rate in most of the hospitals being at least 20 to 25 per cent. greater. Besides, the convalescence of those who recover is, as a rule, much more prolonged than it was last year and the sequelæ are much more serious and give little promise in many cases of ever permitting the patients to be quite themselves again.

THE TREATMENT OF ACUTE HEMORRHAGIC PANCREATITIS.

Our knowledge of diseases of the pancreas, apart from neoplasms, is of comparatively recent origin, but enough has been learned to place them therapeutically in the category of surgical disorders. The etiology of these affections is exceedingly obscure, the causative factors in some instances no doubt being bacterial, while in others they are with even greater certainty chemical. In yet another group of cases, arteriosclerosis and atheroma are the underlying factors. The exciting agents may be conveyed through the blood stream or through the ducts of the pancreas. The inflammation to which they give rise under these circumstances may be hemorrhagic, suppurative or gangrenous. The resulting symptoms are often suggestive of intestinal obstruction, with constipation, severe abdominal pain and distention and vomiting. The expression becomes anxious and pinched, and the skin and conjunctiva may assume a yellowish tint. The pulse is small and rapid, while the temperature is irregular and variable. A tender mass may be palpable in the epigastrium.

The clinical picture is thus not distinctive and the diagnosis is accordingly difficult. When, however, the condition is suspected and its presence can with reasonable certainty be recognized, the only hopeful method of treatment is surgical. A case illustrative of the good results to be obtained from such a course has recently been reported by Mr. T. C. Litler Jones.[1] The patient was a woman, 26 years old, obstinately constipated, who on turning in bed was seized with severe abdominal pain, as "if something had twisted." In a little while vomiting set in, the abdomen became distended, the expression anxious, the mouth dry, the tongue covered with a foul fur. Free fluid was demonstrable in the abdominal cavity and a painful area was present in the epigastrium with localized swelling. The pulse was feeble, fluttering and accelerated, the temperature subnormal. It was thought that perforation of a gastric ulcer had taken place; accordingly, the abdomen was opened and about three pints of bright blood mixed with serum were evacuated. Areas of fat necrosis being observed at the entrance to the lesser sac of the peritoneum, an opening was made through the gastrocolic omentum, disclosing the discolored, edematous and in places hemorrhagic pancreas. A longitudinal incision was made through this organ after the surrounding area had been packed with gauze. The presence of a possible obstructing stone or abscess was looked for, but only a dilated space was discovered by the examining finger. This space was packed with gauze, the end of which was brought out of the abdominal wound, and the latter in turn was closed in its lower two-thirds. The packing was removed after thirty-six hours, when a discharge of clear pancreatic fluid began and continued for a time. Except for an abscess in the abdominal wall, recovery was uncomplicated.

The foregoing case of hemorrhagic pancreatitis is but one of a considerable number that have now been placed on record in which, sometimes after a correct diagnosis, at other times after an incorrect diagnosis, successful operation has been undertaken, whereas merely expectant treatment would in all likelihood have terminated

1. Lancet, Feb. 18, 1905, p. 418.

fatally. Here, as in a number of other conditions, the ground can be taken that the risk of operation is less than the dangers from non-interference. Of course, the chances are better for successful results from surgical intervention the earlier the diagnosis is made, and with this end in view the possibility of pancreatic disease should be considered in any case presenting obscure abdominal symptoms, and especially those of intestinal obstruction not attributable to any obvious condition or to one of the ordinary causes.

TRUTH AND POETRY CONCERNING URIC ACID.

XV.

Despite the discouraging results of the attempts to explain the excess of uric acid in the blood in gout by studies of uric-acid excretion, total nitrogen excretion, and phosphoric-acid excretion, investigators have tried in various other ways to get clues to the explanation of the phenomenon. Some have sought to show that the excretion of uric acid is faulty owing to disease of the kidneys, others that there is a retention owing to the occurrence in the blood either of a form of uric acid unsuitable for excretion or of conditions which are unfavorable to solution of ordinary uric acid and urates, and still others that there is an increased production of uric acid, oxidative or synthetic, owing to the hyperactivity of certain organs. No efforts have been made so far as we know to determine whether or not the destruction of uric acid which normally goes on in the body is decreased, though it is important that we should be definitely informed on this point.

The idea that uric acid is retained in the blood in gout on account of impairment of the excretory power of the kidneys, due to organic or functional disease, has been strongly held by Garrod, by Levison, by Luff[1] and by Strauss,[2] and as strongly opposed by Cantani, by Ebstein, by Pfeiffer, by Schreiber,[3] by Schmoll, by Smith-Jerome and by Reach. Those who favor the view urge (1) that there are periods of diminished uric-acid excretion in gout, followed by periods of increased excretion; (2) that it is rare to find cases of gouty arthritis at autopsy unassociated with disease of the kidneys; (3) that it is common at autopsies on nephritic patients to find joint deposits which have been wholly unsuspected during life, especially in one particular form of kidney disease, namely, granular atrophy; (4) that toxic influences such as lead poisoning and alcoholism stand in an etiologic relation both to gout and to contracted kidney; (5) that uric-acid retention obviously occurs in nephritis and is associated with excess of uric acid in the blood; (6) that in gouty cases, without albuminuria or casts in the urine, defective functioning of the kidney may often be detected by observing beginning hypertrophy of the heart, changes in the eye grounds, nitrogen retention without increase in body weight, slowed excretion of methylene blue and alterations in the molecular concentration of the urine. On the other hand, those who oppose the view maintain (1) that the excess of uric acid in the blood in gout precedes the development of kidney disease and that many gouty patients have normal kidneys; (2) that the disease of the kidneys common in the later stages of gout is not the cause but the effect of the gouty disorder, and (3) that the kidneys in gout are capable of excreting far larger amounts of uric acid than normal if the formation of the substance in the body be markedly increased by thymus feeding. The first objection has been met by Minkowski's assumption that when the kidneys seem normal, in reality a functional disease exists in which the secreting elements of the kidney alone are affected, leading to an increase of the "threshold" for uric-acid excretion; and Strauss has tried to deprive the third objection of its force by bringing the proof that, even in true nephritis, uric-acid excretion may be increased by feeding large amounts of meat extract.

The hypothesis that an excess of uric acid accumulates in the blood in gout, not on account of diseased excretory organs, but owing to its existence in some forms other than the ordinary—in a form, in fact, in which the kidneys can not seize hold of it to excrete it, is an old one; it was suggested as early as 1860 by Parkes, and has since been revived by various physicians. For a time, Pfeiffer held this view, but the evidence he brought in favor of it by means of his so-called "uric-acid filter," has been shown to be invalid. Still, no less a scientist than Minkowski has recently expressed the opinion that uric acid may circulate in the blood in a form which does not appear to be suitable for excretion into the urine, and the possible existence of such conditions should therefore be borne in mind. Others think it less probable that a special form of uric acid exists in the blood than that the conditions of solubility vary; a decreased alkalinity of the blood, for example, being held guilty, by Roberts and others, for uric-acid retention.

In contrast with the above views, in which uric-acid retention is held answerable for the excess of uric acid in the blood in gout, are the speculations which assume that the established excess is the consequence of increased formation of the substance. When such speculations first arose, disease of certain organs—the spleen or the liver, according to the prevailing view at the time of uric-acid formation—was postulated as the cause of the increased production. At the period when uric acid was supposed to be derived from albumin by faulty oxidation, slowing of the metabolic processes in various tissues, it was thought, could account for increased formation in gout; and, later, when the oxidative origin from nucleins had been demonstrated, the excess of uric

1. Luff, A. P.: The Pathology and Treatment of Gout. Brit. Med. Jour., Lond., 1898, I, 150; 1066.
2. Strauss, H.: Pathogenese und Therapie der Gicht im Lichte der neueren Forschungen. Würzburger Abhandl., 1902, II, 209.
3. Schreiber, E.: Gicht: Ueber die Harnsäure unter physiologischen und pathologischen Bedingungen. Stuttgart, 1899.

acid in the blood was attributed by some to hyperactivity of the bone marrow and muscles, by others to increased destruction of leucocytes and by still others to a generally increased cell destruction in the body. There is no proof, however, of the existence in gout of any of the conditions mentioned and, should they exist, it is not easy to see why their effects should not be neutralized either by increased destruction of uric acid or increased excretion of the same.

The question of an increase of uric acid by synthesis in gout has scarcely yet been put. Wiener suggests it as a possibility, on account of the relation of oxaluria to gout, but no experimental work of any importance in this connection has yet been done.

Finally, since we are totally ignorant of any modification of uric-acid destruction in gout, we can sum up our knowledge concerning the cause of uric-acid excess in the blood by saying that it is not yet wholly clear, but that probably several factors are variably concerned, and that none of the factors alone can explain a permanent excess without the assumption of a pathologic retention, for otherwise equilibrium would always be restored by increased excretion.

SANITARY CONDITIONS IN THE BAHAMAS.

The Geographical Society of Baltimore two years ago undertook a scientific expedition to the Bahamas, the islands off the Florida coast which are owned by Great Britain. The report of this expedition has recently been published and that portion entitled "Sanitary Conditions in the Bahama Islands," by Dr. C. A. Penrose, is of especial interest. He states that as different islands are inhabited by descendants of different races it is possible to study racial peculiarities under similar tropical conditions and varying degrees of civilization. In certain islands the whites outnumber the negroes, while in others the negroes are in the majority; and between these two extremes mixtures of black and white blood can be noted. From a racial and scientific standpoint this affords an excellent opportunity of studying the immunity, or lack of it, of the whites, blacks and mulattoes and of contrasting the one with the other. Dr. Penrose describes in detail the equipment and method of work among the natives. He states that by far the greater proportion of diseases are of the commoner varieties. Tuberculosis on the islands, he found, is generally of the fibroid or "chronic" type, and he did not see a case of the so-called "galloping consumption." This fact should be given consideration as the Bahamas have frequently been recommended as a health resort, especially for pulmonary conditions. Rheumatism and lumbago and, at certain seasons, malaria are prevalent diseases. Everywhere throughout the islands he found diseases of the eye. He found several cases of congenital pigmentary retinitis and choroiditis with optic nerve atrophy, considered by the authorities to be due to consanguineous marriages. Leprosy is very common. With the exception of a lazaretto at Nassau, the government has made no provision for these unfortunates. In studying the cases of degeneracy on the islands, Dr. Penrose came to the conclusion that it is largely caused by intermarriage. A genealogic chart is included in the report which illustrates this very clearly. The family in question includes among its members idiots, lepers, deaf mutes and blind. Dr. Penrose is of the opinion that unless new blood is introduced into the islands succeeding generations will sink to even a lower state of degeneracy, and that the colony will ultimately exterminate itself by intermarrying. He advises empowering the authorities to remove and to isolate all lepers and all persons whom they have reason to suspect will develop leprosy; to confine all idiots and imbeciles in an asylum, and to introduce new blood among the inhabitants. The government supports a well-equipped hospital at Nassau; there are no private wards and treatment is free, but in spite of this many of these people are suffering for lack of medical attention.

SKIPPING-ROPE FATALITIES.

Even among the apparently milder forms of children's athletics there are some that are capable of producing injury or are even deadly at times. The newspapers have recently reported the death from heart failure of three children in a skipping-rope competition and a little later another case of fatal appendicitis from the same cause was also reported in the press dispatches. Such deaths are not so rare and it would seem a proper subject of inquiry just how far and why this particular form of exertion is more dangerous than other similar pastimes indulged in by young children so commonly at this season of the year. In some respects it would seem an almost ideal exercise in moderation, but we do not hear so often of death occurring in other games involving equal or even greater, though more varied, muscular exertion. All excesses and overexertion should, of course, be discouraged, but if there is any special peril in the skipping-rope exercise *per se*, it certainly should be discouraged as a child's pastime.

THE CONFERENCE OF THE COUNCIL ON MEDICAL EDUCATION.

The Council on Medical Education of the American Medical Association held the first of its annual conferences with the various state and territorial licensing and examining boards, and other bodies interested in medical licensure and medical education, at Chicago last week. The governors of twenty-nine states appointed representatives of their respective examining boards, seventeen states being represented. Representatives were also present from both of the college associations and from the United States Army and the Marine-Hospital Service, the American Medical Association being represented by the members of the council and by the president-elect, Dr. Lewis S. McMurtry. The subjects that came up for discussion were uniform entrance requirements, uniform college curricula, a uniform standard for recognition of medical colleges by all the states, the relation between the college of liberal arts and the medical school, and reciprocal registration. The importance of reciprocity among the states was emphasized by the earnestness with which this subject

was discussed. Especially noteworthy was the discussion on the question of how the American Medical Association can co-operate with these various bodies in elevating and controlling medical education. All the representatives were unanimous in the opinion that the association, through the Council on Medical Education, is pre-eminently fitted for bringing together the various bodies that are so earnestly working, each in its own way, to raise the standard of medical education. A full report of the proceedings of the conference will be published in THE JOURNAL later.

Medical News

ALABAMA.

Isolation Hospital Ready.—The new isolation hospital for Montgomery, consisting of five separate buildings, commodious and thoroughly equipped, is ready for formal transfer to the city.

Personal.—Dr. Coleman D. Gay has been elected a member of the common council of Lineville.——Dr. Gilbert B. Wimberly, Reform, missed his footing while attempting to board a street car in Mobile and fell, cutting a gash in his chin and knocking out a tooth.

Commencements.—The thirty-ninth annual commencement exercises of the Medical College of Alabama were held at Mobile, April 7. Dr. George A. Ketchum read the report of the faculty, degrees were conferred on a class of 31 by Hon. J. A. Abercrombie, president of the University of Alabama, and Lieut.-Gov. Dr. Russell McW. Cunningham, Ensley, delivered the annual address on "The Doctor—His Qualifications, His Work and His Reward."——Birmingham Medical College held its eleventh annual graduating exercises April 3. Degrees were conferred on a class of 14 by Dr. Benjamin L. Wyman, dean of the faculty; Dr. Edward H. Sholl delivered the charge to the class, and Dr. Harris A. Gant, Jackson, Miss., delivered the annual address on "The Importance of Medical Organization, Which Leads to Higher Medical Education." Lieut.-Gov. Cunningham also addressed the class.

CALIFORNIA.

Banquet President.—Dr. Frank L. Adams, Oakland, president of the Medical Society of the State of California, was the guest of honor at a banquet, April 8, at the Hotel Metropole, given by the Alameda County Medical Society.

Hospital Notes.—The new hospital at the Odd Fellows' Home, Oroville, was dedicated April 7.——Providence Hospital, Oakland, was opened with formal ceremony, April 5, just one year after its dedication.——The annex to the Los Angeles County Hospital, consisting of two ward buildings, an isolation hospital and a power house, has been completed and turned over to the authorities.

Personal.—Dr. Frederick H. Huning, Ventura, has been appointed physician of Ventura County.——Dr. Irzael M. Proctor, Petaluma, has resigned as president of the local health board.——Dr. Henry C. Brown, San José, has returned after a ten months' stay abroad.——Drs. Franklin M. Seibert, W. Lee Norris and I. R. Goodspeed have been appointed members of the San Mateo Board of Health.——Dr. Gerald J. Fitzgibbon has returned to San Francisco after a six months' tour abroad.

The Governor's Veto.—Governor Pardee's message which accompanied his veto of the antivaccination bill recently passed by the legislature, which has been commended in THE JOURNAL, contains the following paragraphs which are noteworthy for the clear expression of the principle involved in the vaccination question:

> Before the discovery and application of vaccination by the immortal Jenner, smallpox was nearly universal, and it was considered to be a grave disadvantage not to have had the disease in childhood. Severe and terrible epidemics have gradually but surely become things of the past, except when from any cause vaccination has been neglected. That accidents of many kinds, even death, may follow vaccination, is not and can not be denied. But that the number of these accidents, compared to the many, many thousands—even millions—of times which this beneficent procedure is practiced is anything but infinitesimal is not borne out by the facts. When vaccination is compulsory, and the law is well administered, there is but little smallpox; so little that those protected by vaccination soon lose their fear of the dread disease; and turning our attention to the lesser evils of the vaccine virus, many of us conjure a fear, not warranted by facts, against the very thing that saves us from a much worse fate. This, I think, is what has called into being the bill which I now return to you unsigned. Were it to become a law, there can be no doubt that vaccination would soon fall into practical disuse; and thus would be prepared among our children (not mine, for they shall always be protected) a field for smallpox to fairly revel in.

COLORADO.

Hospital Sold.—St. Luke's Hospital, Leadville, has been purchased by a syndicate of physicians and will be remodeled and enlarged.

Goes to Penitentiary.—Dr. Emmett E. Sonnanstine, Colorado Springs, was taken to Canon City, April 12, to serve a term of five to six years in the state penitentiary for a statutory offense against a young girl.

State Board Organizes.—The State Board of Health met at Denver, April 10, and organized. Dr. William H. Davis, Denver, was elected president; Dr. George C. Steinen, Denver, vice-president; Dr. Frank N. Carrier, Canon City, treasurer; Dr. Hugh L. Taylor, Denver, secretary, and Dr. Minnie C. T. Love, Denver, chairman of the executive committee.

GEORGIA.

Personal.—Dr. Fred Grady Hodgson has been appointed to the medical staff of the Wesley Memorial Hospital, Atlanta.

Applies for Charter.—The Atlanta Society of Medicine filed application for a charter, April 5. The incorporators are Drs. Alexander W. Sterling, Luther P. Stephens, Miller B. Hutchins, Walter B. Emery, Emil Van Goidtsnoven and E. Bates Block.

Anti-Tuberculosis Commission's Work.—The anti-tuberculosis commission appointed by the governor met at Atlanta, April 18. Dr. Bernard Wolff, Atlanta, the secretary, has sent out blanks to all the physicians of the state. To these about 400 replies had been received which show that there have come under the observation of these physicians in the last year 1,555 cases of tuberculosis, and that about 50 per cent. of the cases have proved fatal. There have been recoveries in about 9 per cent. of the cases. It is estimated that there are about 10,000 cases of tuberculosis in the state.

ILLINOIS.

Personal.—Drs. Roy F. Rogers, Shelbyville, and Emil Ries, Chicago, have gone to Europe.

Change in Examination Date.—The examination for internes of the Illinois Charitable Eye and Ear Infirmary, Chicago, will be held May 8 and 9, at 2 p. m., instead of May 3 and 4.

Society Elections.—Whiteside County Medical Society, at its meeting in Sterling, April 12, elected the following officers: Dr. Frank Anthony, Sterling, president; Dr. Charles A. Griswold, Fulton, vice-president; Dr. Clarence M. Frye, Rock Falls, secretary, and treasurer, Dr. John F. Keefer, Sterling.——At its fifth anniversary meeting, held April 20, Jo Daviess County Medical Society elected the following officers: President, Dr. Alfonso C. Czibulka, Warren; vice-president, Dr. Thomas J. Stafford, Stockton; secretary and treasurer, Dr. Domer G. Smith, Elizabeth, and censors, Drs. Hugh F. Gunn, Galena, H. B. Gratiot and Charles E. Wright, Scales Mound.

Legislative News.—Senate bill No. 311, the osteopathic measure described in the last issue of THE JOURNAL, passed the senate April 20 by a majority of one. The bill was reported to the house April 21, and a motion was made that it be advanced to second reading without reference to a committee, but through the efforts of Representative Smejkal this was lost. The bill was ordered to a first reading, but it had not been read up to April 25. After the first reading the bill will be referred to a committee. The optometry bill (Senate No. 237), and the osteopathic house bills (Nos. 228 and 229), are still in the judiciary committee of the house. The anti-vivisection bill (Senate No. 271) is in the license committee of the house. The senate bills, unpassed (Nos. 169 and 292), are still on third reading in the senate. The general assembly will adjourn early in May. The representatives of the medical profession in Springfield are hopeful that none of the osteopathic optometry or antivivisection bills now pending will find a place on the statutes of 1905.

Chicago.

The Week's Mortality.—During the week ended April 22, 558 deaths occurred, 10 more than for the preceding week, but 85 less than for the corresponding period of 1904. Consumption caused 78 deaths; pneumonia, 72; heart diseases, 45; nephritis, 40; cancer, 32; violence, 28; bronchitis, 25; measles, 13; diphtheria, 8; whooping cough, 8; scarlet fever, 3, and smallpox, 2.

New Hospitals.—The first spadeful of earth in the excavation for the new Michael Reese Hospital was turned April 21, by Isaac Greensfelder, who performed the same office when the original building was commenced, a quarter of a century ago. The new hospital will cost $475,000.——Plans have been prepared for the new Swedish-American Hospital to be erected at Green and Sixtieth Streets at a cost of $100,000.

Consumption Again Leads.—After a briefer term than usual, pneumonia again yields to consumption as the principal cause of death. During the week there were but 72 deaths reported from the former and 78 from the latter disease. Between Nov. 1, 1904, and April 22, a total of 2,489 deaths were reported from pneumonia and 1,583 from consumption—these figures showing 556 fewer pneumonia and 75 more consumption deaths than for the previous corresponding pneumonia season, when the totals were 3,045 pneumonia and 1,513 consumptive deaths. The decrease of pneumonia has been the chief factor in the reduced general mortality rate of this period. During the 175 days ended April 23, 1904, there were 14,741 deaths from all causes reported; during the corresponding period ended April 22, 1905, there have been 13,387 deaths from all causes reported—or 1,454 fewer, of which number 556 were of the pneumonia deaths.

KANSAS.

Personal.—Dr. William S. Lindsay, Topeka, has been elected dean of the Kansas Medical College; Dr. William E. McVey, Topeka, has been elected secretary of the college, vice Dr. Robert S. Magee, Topeka, resigned.

Commencement.—The fifteenth annual commencement exercises of the Kansas Medical College, Topeka, were held April 18, when eight graduates received diplomas from the president of Washburn University, Rev. Norman Plass, D.D. The faculty address was delivered by Dr. William F. Bowen.

Communicable Diseases.—During March 137 cases of tuberculosis were reported in the state, and 86 deaths; 166 cases of scarlet fever, with 9 deaths; 1,123 cases of smallpox, with 5 deaths; 63 cases of diphtheria, with 6 deaths, and 97 cases of typhoid fever, 75 of which were in Kansas City, with 14 deaths.

Fraud Order Issued.—The postmaster general has directed the issue of a fraud order against the Physicians' Protective Association and the United States Protective Association of Kansas City, Mo., and Coffeyville, Kan., for conducting a fraudulent business. The concerns are identical and advertise as "sure collectors" of old accounts due physicians.

Increase in Epidemic Disease.—The reports received for March indicate an increase of all epidemic contagious diseases, particularly smallpox, and the State Board of Health urges that disinfection of all infected places and things be thorough and complete, that the epidemic may be controlled and not break out again on the arrival of cold weather next fall.

MARYLAND.

Will Maintain Hospital.—The Washington County commissioners have agreed to levy $2,000 annually in perpetuity for the maintenance of a hospital at Hagerstown.

Endows Room for Poor Male Patients.—Mrs. James Wallace has offered to equip a room in the proposed Washington County Hospital and endow it for poor male patients.

Smallpox in Hagerstown.—Smallpox has appeared in six families in Hagerstown. The houses have been closely quarantined, with guards to watch them day and night. Dr. Fulton, secretary of the State Board of Health, believes the disease was brought from Virginia by a cigar salesman.

Baltimore.

Personal.—Dr. L. McLane Tiffany is at his summer home, Mount Custis, in Accomac Co., Va.——Dr. William H. Baltzell spent the Easter holidays in Jerusalem.——Dr. Mattie B. Ingold, a graduate of the Woman's Medical College and for seven years a medical missionary at Seoul, Korea, has returned to America on a visit.

Physicians Approve Sewage Plan.—As a result of a conference, a committee of medical men has sent out a strong appeal to the profession to assist in securing the passage of the sewerage loan on May 2. The paper is signed by Drs. Isaac E. Knison, John S. Fulton, William H. Welch, William Osler, Hugh H. Young and many others.

Hospital Notes.—There were 2,001 cases treated at St. Joseph's Hospital last year.——The Franklin Square Hospital, belonging to the Maryland Medical College, is undergoing reconstruction. A fourth story and also two large four-story wings will be added, making a building 84 by 100 feet. The capacity will be increased from 40 to 100 patients. About $30,000 will be expended.——The Board of Public Improvement has approved the city council ordinance appropriating $25,000 for the construction of a hospital for infectious diseases, to be located on the grounds of the city almshouse.

Aims of Medical Inspection of Schools.—Dr. R. Tunstall Taylor of the Hospital for Crippled and Deformed Children summarized the aims of public school inspection before the teachers' institute as follows:

To detect infectious and contagious diseases and prevent epidemics in schools.
To rectify, as far as possible, physical ailments in the children which cause frequent absence from school.
To detect imperfect sight and hearing.
To promote cleanliness.
To note limping and call attention to detrimental habits in standing and walking.
To detect the causes and aid the prevention and correction of spinal deformities.

Diphtheria Statistics.—During November and December, 1904, the weekly cases of diphtheria reported to the Bureau of Health were considerably in excess of those of the preceding months and also of the same months of the two preceding years. This led the authorities to believe that in some quarters the condition was unusual and presaged an alarming epidemic. Comparative studies of the winters 1902 and 1903, 1903 and 1904, and 1904 and 1905 were made. The results of these studies show that for the winter of 1902-03, during the four months of November, December, January and February, there were reported 798 cases, with 127 deaths, a mortality of 16 per cent. During the same months of the following winter, 1903-04, there were reported 1,254 cases, with 204 deaths, a mortality of 16.3 per cent., while for the same four months of the present winter there were reported 1,517 cases, and 193 deaths, equivalent to a mortality of 12.7. While the number of cases for the four months of this winter was 21 per cent. greater than that of the corresponding period of last year and 90 per cent. greater than the same period in 1902-03, the number of deaths this year was 5 per cent. less than in last year, and only 52 per cent. greater than that recorded for 1902-03, notwithstanding the fact that the number of cases was almost 100 per cent. greater than in that winter. From 1902-03 to 1903-04 the increase of cases was 67 per cent. and that of deaths 61 per cent., so that a fair parallel between the two increases existed, but from 1903-04 to 1904-05 the increase of cases was 21 per cent., while the deaths diminished 5 per cent. The records of the Municipal Hospital for the same period exhibited a fair degree of correspondence with the foregoing figures for the city as a whole, as shown by the following:

Nov. 1 to March 1.	Cases admitted.	Deaths.	Mortality, per cent.
1902-03	190	36	18.9
1903-04	276	62	22.5
1904-05	357	46	12.9

No single satisfactory reason is given for this. It may be due to several causes. The disease this year may have been of a milder type than usual, a deviation not unknown to epidemiologists, and a condition that is most favorable to its wider dissemination, for mild cases rarely receive the care given to severe ones, or the care warranted by their true nature. The use of antitoxin, both as a prophylactic and therapeutic agent, is growing in favor, as is shown by the following report of the antitoxin dispensed by the Health Bureau:

	Nov.	Dec.	Jan.	Feb.	
1902-03	324	433	319	319	Total—1,395 doses
1903-04	605	1,081	508	731	Total—2,925 doses
1904-05	1,444	1,990	1,676	961	Total—6,071 doses

It has also been shown that careful bacteriologic examinations of inflammatory conditions of the throat show many apparently benign conditions to be etiologically of a serious nature, and the careful work of the school instructors has resulted in the discovery of a number of mild cases of diphtheria that would otherwise have been unrecognized. Whatever the explanation may be, it is gratifying to know that there have been many more cases during the four winter months of this year than in the corresponding period of the preceding two years, but that the death rate is almost 25 per cent. less than those recorded for other years.

MASSACHUSETTS.

Food Adulteration Prosecutions.—Besides the usual number of prosecutions for milk adulteration, there have been detected and fined recently in Boston several oyster dealers, who were using borax and boric acid as preservatives.

Would Abate Spitting Nuisance.—The United Improvement Association of Boston is seeking to assist in abating the nuisance of spitting in public places. The members feel that the present fine of $100 is too high and are urging that a fine of $5 or $3 would be more efficient, as there would be more prosecutions.

Boston Disease and Deaths.—For the 14 weeks ended April 22 there were 3,159 deaths reported in Boston, as against 3,150 in the corresponding period last year. There were reported 434 cases of diphtheria, with 54 deaths; 396 of scarlet fever, with 18 deaths; 135 of typhoid fever, with 22 deaths; 132 of measles, with 6 deaths; 645 of tuberculosis, with 354 deaths, and 6 of smallpox. There were 554 deaths from pneumonia, 6 from whooping cough, 355 from heart disease, 92 from bronchitis, and 42 from marasmus. Of the decedents 485 were under 1 year, 697 under 5 years and 895 over 60 years.

Personal.—Dr. William G. MacDonald has been appointed medical examiner of Suffolk County to succeed Dr. Frank W. Draper, resigned.——Mayor Collins has reappointed Dr. Samuel H. Durgin a member of the Boston Board of Health.——After 20 years of service Dr. Edward B. Lane has resigned as superintendent of the Boston Insane Hospital. His successor is Dr. William Noyes, who has been assistant superintendent and in charge of Pierce Farm.——Dr. George E. Maxfield has been appointed first assistant in the men's department, and Dr. Franxis X. Corr assistant physician in the women's department.

MISSOURI.

St. Louis Graduates.—St. Louis College of Physicians and Surgeons held its annual commencement exercises April 14, when a class of 29 was graduated.

Neurologists Form Society.—A number of St. Louis physicians met February 27 and organized the St. Louis Neurological Society. Dr. Frank R. Fry was elected president, and Dr. Given Campbell, Jr., secretary.

St. Louis Hospital Improvements.—The new City Hospital pavilions are nearly ready for occupancy.——The new St. Ann's Infirmary, on Union and Bell Avenues, is nearly ready for occupancy.——Of the $100,000 required to build two new wings to the Jewish Hospital, $80,000 has been received and work will begin at once.

Personal.—Dr. Thomas E. Graham, Albany, was appointed attending physician at State Hospital for the Insane No. 2, St. Joseph, vice Dr. William L. Whittington, St. Joseph.——Dr. St. Elmo Sanders has been confirmed by the Kansas City common council as city physician.——Dr. Daniel McSwegan has returned from Europe and has located at Excelsior Springs.——Dr. Horace M. Julian, St. Louis, was injured in a runaway accident, April 13.

St. Joseph Commencements.—Ensworth Medical College graduated a class of 22 at its twenty-eighth annual commencement exercises, held April 20. The address was delivered by President Green of William Jewell College, Liberty, Mo.——class of 17 received diplomas at the commencement exercises of Central Medical College, held April 17. The faculty address was given by Dr. Arthur B. McGlothlan, and Dr. Thompson E. Potter, president of the college, conferred the degrees.

NEW YORK.

Will Extend Term.—The faculty of the medical department of the University of Buffalo has resolved to lengthen the annual term from seven to eight months.

No Cause of Action.—In the case of Mary Smith vs. Dr. Martin Cavana, Oneida, in which malpractice was alleged and $3,000 damages asked, the jury found for the defendant with a verdict of "no cause of action."

Legislative News.—The assembly recommitted the three bills at the request of the State Health Bureau. They are very drastic, as they compel all plans for water supplies, as well as sewage systems of cities and villages, except New York City, to be submitted to the Health Bureau for its approval.

Did Not Report Contagious Disease.—Dr. Francis M. Rich, Buffalo, was fined $10 and $2 costs for violating the city ordinance requiring physicians to report to the Health Department all cases of contagious diseases under their care. Dr. Rich claimed that he had twice called up the Health Department to make the report, but could get no answer.

Hospital Gifts.—An anonymous benefactor has given $10,00[illegible] to the Titusville Hospital endowment fund.——Mrs. Emily H. Grummond has given a children's ward to the Binghamton City Hospital, as a memorial to her late husband.——Remington Vernam has donated five lots at Arverne, L. I., as a site for a proposed emergency hospital.——The Cohoes Hospital fair netted $2,230.17 for the institution.

Health Board Changes.—Dr. Sylvester C. Clemans, city physician of Gloversville, resigned.——Dr. Charles V. Patchin appointed to Dansville village and town board of health.——Dr. Roy B. Dudley appointed health officer of Clinton.——Dr. Christian C. Vedder appointed health officer of St. Johnsville.——Dr. Frank W. Green appointed health physician of Sinclairville, vice Dr. George F. Smith, resigned.——Dr. Charles W. Shaver appointed health officer of Camden.——Dr. Andrew J. Martin appointed health officer of North Tonawanda.——Dr. Jeremiah H. Sullivan appointed health officer and registrar of Charlotte.

Personal.—Dr. Louis A. Weigel, Rochester, who was severely burned by continuous exposure to *x*-rays, has returned from Jamaica and will resume practice. He suffered amputation of the right hand and of part of the left hand.——Dr. Henry C. Baum, Syracuse, assistant surgeon of the Third Battalion, N. G., N. Y., has applied for retirement after continuous service of twenty-five years. He has been succeeded by Dr. Reeve B. Howland, Elmira, first lieutenant and assistant surgeon of the Thirtieth Separate Company, N. G., N. Y.——Dr. William H. Marcy has been chosen surgeon of the Buffalo fire department as the result of a civil service examination. The position is for life and the salary is $1,500 per year.

New York City.

Personal.—Dr. Antonio Fanoni, of New York, has been made a knight (Cavaliere) of the Italian Order of the Crown.

Contagious Diseases.—There were reported to the Sanitary Bureau for the week ended April 15, 473 cases of measles, with 9 deaths; 372 cases of tuberculosis, with 175 deaths; 325 cases of diphtheria, with 31 deaths; 260 cases of scarlet fever, with 11 deaths; 182 cases of cerebrospinal meningitis, with 117 deaths; 16 cases of typhoid fever, with 6 deaths; 180 cases of chicken-pox, and 2 cases of smallpox, with 1 death.

Hospital Notes.—A slight fire occurred in the Metropolitan Hospital, which was controlled without much difficulty or serious loss.——A new emergency hospital has been opened at Coney Island, which is under the charge of Dr. John J. Dooling, Brooklyn.——Plans have been filed with the Building Bureau for the enlargement of the New Amsterdam Eye and Ear Hospital by annexation of the adjacent building.

A Lower Death Rate.—The figures given out by the Health Board for the week ended April 20 show a death rate of 4.06 points lower than for the corresponding week of last year. There were 248 deaths from pneumonia, while for the corresponding week of 1904 there were 409 deaths from this cause. In the week ended April 8 there were 232 deaths from pneumonia, while in the corresponding week of 1904 there were 429 deaths.

New Training Schools.—Through the efforts of Dr. Abraham Mayer a new training school for nurses will be established in connection with the Lebanon Hospital. The building will accommodate about 75 nurses and will cost $50,000.——A training school for nurses has been started at the new French Hospital. Applicants are not required to speak French, but will receive instruction in the language as a part of their course. The hospital has a capacity of about 130 beds, including private rooms.

Hospital Fund Divided.—The distribution of the hospital fund, after deducting $10,000 for gifts to particular hospitals and $6,000 to meet past expenses, has been made by the committee of the Hospital Saturday and Sunday Association among 38 institutions. This fund amounted to about $76,000 and among the chief beneficiaries were: Montefiore Home and Hospital, $7,600; Mt. Sinai Hospital, $5,059; St. Luke's Hospital, $4,370; German Hospital, $4,397; Roosevelt Hospital, $3,941; Nursery and Children's Hospital, $3,879; Lebanon Hospital, $3,682; Lincoln Hospital and Home, $3,654; Ruptured and Crippled Hospital, $3,569, and Post-Graduate Hospital, $3,000.

Cerebrospinal Meningitis.—The death rate from this disease now averages about 15 a day. The number of deaths from January 1 to the present time is 1,006, while for the whole of last year it was only 1,411. The commission appointed to investigate the spread of this disease, while it does not take on itself to advise the Board of Health, believes that the communicability of cerebrospinal meningitis has been sufficiently well established to warrant isolation. Henceforth such disease must be reported to the Health Department. At the regular meeting of the Academy of Medicine, April 20, Dr. George L. Peabody read a paper on the treatment of cerebrospinal men-

ingitis by diphtheria antitoxin, and the statement was emphatically made that this treatment was good for nothing. Gouverneur Hospital is the only hospital of importance in New York City that favors its continuance. Dr. Peabody's opinion was heartily indorsed by Drs. Francis P. Kinnicutt, Presbyterian Hospital; Henry P. Loomis, Bellevue Hospital; William K. Draper, Bellevue Hospital; Richard Van Santvoord, Harlem Hospital, and William M. Leszynsky, Lebanon Hospital.

PENNSYLVANIA.

Personal.—Dr. William B. Ulrich, ex-president of the state medical society, is seriously ill at his home in Chester, with influenza.

Memorial to Dr. Drown.—Lehigh University, it is said, proposes to erect a memorial hall to cost $80,000, to the memory of the late president of the university, Dr. Thomas Messenger Drown, who died last year.

Health Bill Approved.—The bill granted to those having charge of the public health and sanitation in Philadelphia, the power to make rules and regulations governing the care and control of persons suffering from cholera, typhoid fever, yellow fever, typhus fever, scarlet fever, relapsing fever, smallpox, chicken pox, diphtheria, diphtheritic croup, membranous croup, cerebrospinal meningitis, measles, mumps, whooping cough, tuberculosis, pneumonia, erysipelas, puerperal fever, plague, trachoma, leprosy, tetanus, glanders, hydrophobia and anthrax, was approved by the governor, April 20.

Right to Operate Without Consent.—The suit of $20,000 against Dr. Daniel P. Maddux of the Chester Hospital resulted in the failure of the jury to agree after 24 hours' deliberation. The plaintiff entered suit after the death of his 15-year-old daughter, who died at the Crozier Hospital, Chester, 15 hours after she had been operated on for appendicitis by Dr. Maddux. The plaintiff contended that the operation had been performed against his express wishes. The defense produced evidence showing that the case was one of life or death, and that the operator was justified in taking the chances he did, in the endeavor to save the girl's life. It is said that the jury stood five for the plaintiff and seven for the defendant.

Hospital Examinations.—The Allegheny General Hospital will hold competitive examinations for resident physicians in the civil service rooms, City Hall, Philadelphia, and also in the Y. M. C. A. rooms, Pittsburg, Pa., April 29, at 9 a. m.——The City Hospital, Wilkesbarre, will conduct its examinations for resident physicians at the office of the secretary, Dr. Lewis H. Taylor, April 29.——The Hamot Hospital, Erie, will hold its examinations for internes May 15. Applications by letter with two letters of recommendation should be sent to Dr. F. A. Goletz, Erie, Pa.——The Western Pennsylvania Hospital, Pittsburg, will hold its examinations at the hospital April 29.——The Harrisburg Hospital has arranged to examine applicants for resident physicians May 29.

Baby Farm Bill Vetoed.—The bill providing that any person who shall in cities of the first class, take into his custody for hire or reward, a child or children under the age of 3 years without having first obtained a license in writing from the Department of Public Health and Charities, shall be guilty of a misdemeanor punishable with imprisonment for one year. This bill the governor vetoed. He says that no doubt the bill has a worthy purpose which it is intended to serve, but it is not clearly defined. The terms in which the bill is drawn will prevent a mother from entrusting a child to a nurse or from sending it out to the park with a servant. The custody of the child may be given by the parents to other persons for many purposes besides that which is known in popular parlance as "baby farming."

Philadelphia.

Memorial to Dr. Craig.—In response to the universal sympathy caused by the death of Dr. A. B. Craig, a committee has been appointed to receive subscriptions for a memorial. It is proposed to erect a suitable tablet to his memory in the new Jefferson Hospital.

Personal.—Dr. George Y. MacCracken sustained a fracture of his right patella April 18. He had just recovered from a similar injury due to a fall on the ice nine weeks before.——Dr. Robert N. Willson, instructor in physical diagnosis at the University of Pennsylvania, has been elected a lecturer on physical hygiene at Union Seminary, New York.

Research Students.—A department of research is in process of development in Jefferson Medical College. The organization is under the supervision of Dr. W. M. Late Coplin, professor of pathology. The plan of organization contemplates the appointment of a small number of selected students who will be assigned special advanced work in the laboratories, clinics and wards of the hospital during the summer vacation. The appointees will be known as special research students, and for the present year will not exceed six or eight in number. It is hoped that this number may be increased after the completion of the new hospital. The selection of the men will be based on college and laboratory standing, availability and preliminary training.

Health Report.—The total number of deaths reported for the week reached 415. This is 62 less than the number reported last week, and 140 less than the number reported for the corresponding period of last year. There is also a decrease in the number of contagious disease cases reported. Typhoid fever, however, is still prevalent, though the malady is of a mild type, and the mortality therefrom comparatively low. The principal causes of death were as follows: Typhoid fever, 19; tuberculosis, 60; cancer, 15; paralysis, 11; heart disease, 54; acute respiratory disease, 48; enteritis, 7; appendicitis, 8, and Bright's disease, 45. The total number of contagious disease cases reported aggregated 258, with 22 deaths, as compared with 246 cases and 35 deaths for the preceding week.

Need Asylum for Criminal Insane.—At the meeting of the Medical Jurisprudence Society Dr. H. Hendrie Lloyd read a paper on "The Need of an Asylum for the Criminal Insane." He argued that such unfortunates require special treatment, and should not be confounded with the insane criminal class. In the former class he said insanity is the chief factor, while in the latter criminality is the chief factor. He argued that the state might profitably differentiate between innocent insane, the criminal insane, and the insane criminal, and provide separate asylums for each class. The verdict of advanced thought is that the criminal insane and insane convicts should not be permitted to associate with the innocent insane, neither should the former class be treated in the same asylum. The insane convict requires and should be given the same prison discipline as that of the penitentiaries. The object of the Pennsylvania law regarding the insane is in the main just and humane. The records show that there are 400 criminal insane in asylums, almshouses and penitentiaries throughout the state, or, in other words, a number sufficient to warrant a separate asylum being established for their care and treatment. The following officers were elected: President, Dr. Henry W. Cattell; vice-presidents, Drs. Adolph Eicholz and Dr. W. M. Late Coplin; secretary, Dr. Henry Leffmann, and treasurer, Dr. Paschal H. Coggins.

GENERAL.

American Gynecological Society.—A change of date has been made, so that this body will hold its annual meeting May 25-27, instead of two days previously.

International Association of Climatologists.—This body will hold its annual meeting in Portland, July 11-14. The secretary is Mr. Charles H. Péck, 259 William Street, New York City.

Plague in the Philippines.—According to the *Public Health Reports*, sporadic cases of plague are found in Manila on an average of one a week. One case was reported recently from Cebu.

Warning Against a Collector.—THE JOURNAL has again received complaints that Frank B. Kennett, against whom its readers were warned Dec. 24. 1904, page 1979, is again endeavoring to obtain subscriptions in Kansas, claiming to be an authorized agent. This individual is not authorized to represent THE JOURNAL, nor to collect money, and we once more give warning not to pay money on account of THE JOURNAL or of the American Medical Association to any one who can not show proper credentials.

Memorial to Finsen.—The committee authorized to receive subscriptions in America for the Niels Finsen memorial fund desires to announce that the collections will be closed in this country by June 1, 1905. Those desirous of contributing to a fitting memorial to the late distinguished Norwegian scientist may send their contributions to Dr. James Nevins Hyde, 100 State Street, Chicago. The nature of the memorial has not yet been decided, but it is fair to infer from the custom of the Danish people with regard to others of its great men that a monument will perhaps be erected in Copenhagen.

CANADA.

Personal.—Dr. F. S. Nicholson, surgeon-major Nebraska National Guard, is visiting in Toronto. Dr. Nicholson is a graduate of Trinity University, and has just completed a post-graduate course in the Army Medical School, Washington, D. C.

Postgraduate Work at McGill.—In the tenth regular course of postgraduate medical instruction to be given at McGill University during June, the faculty will depart somewhat from previous lines and will make each branch optional, attaching thereto a special fee.

The Samaritan Women's Hospital, Montreal.—At the eleventh annual meeting in Montreal last week, the surgeon-in-chief, Dr. Lapthorn Smith, presented the annual report. Of the 146 women admitted during 1904, 28 received medical treatment and the remainder surgical treatment. There were fifty major operations, with but one death.

Ontario Statistics for March.—The deaths throughout the province of Ontario during March numbered 2,417, making a mortality of 14.9 per 1,000 of the population. There is a marked reduction in smallpox, scarlet fever and diphtheria. There were 16 cases of smallpox to 48 last year; scarlet fever, 168 cases to 234 last year; diphtheria, 223 to 267 for the same month during 1904. Tuberculosis caused 200 deaths the same as in March, 1904.

Medical Matters in the Militia.—Authority has been granted for medical attendance to warrant officers, non-commissioned officers and men of the headquarters command and district staffs, ordnance stores corps and their families at public expense, in Nos. 4, 5, 8 and 12 military districts, in which there are no permanent army medical corps, the fees for such to be $1 per visit per diem, and fifty cents for the second and each subsequent visit paid on any one day.

Southwestern Manitoba Physicians Meet.—The annual convention of the Southwestern Medical Association of Manitoba, held in Winnipeg, April 7, was representative of all sections of that province. Dr. McKenty, Gretna, read a paper on "Tubercular Pleurisy"; Dr. J. O. Todd, Winnipeg, and Dr. Montgomery, of the General Hospital, Winnipeg, gave the hospital statistics for the past year and the treatment pursued in the cases of typhoid fever admitted into that institution.

Tuberculosis Disinfection in Montreal.—The Tuberculosis League of Montreal has decided to bring to the notice of the citizens the advisability of disinfection of houses after removal; and will advise prospective tenants to ascertain that the by-law governing this has been complied with. This by-law provides that all houses previously occupied by consumptives shall be disinfected by the proprietors. The league will make arrangements whereby this may be done at a nominal cost.

Dr. Wilfrid Grenfell in Toronto.—For thirteen years Dr. Wilfrid T. Grenfell, a young English medical man, has devoted his life-work to the fisherfolk of Newfoundland and Labrador, his constituency covering over 2,000 miles of coast. At the present time Dr. Grenfell is in Toronto on his annual visit to the United States and Canada, interesting philanthropists in his mission. Dr. Grenfell gives an interesting account of the work done in the three hospitals he has established along the coast and of the hospital-ship donated for the work by Lord Strathcona. The hospitals are wooden structures, and an illustration that they are not of the modern variety is the fact that one of the patients had an ear frozen while lying in bed last winter. Every year about 2,000 people are treated by Dr. Grenfell and his colleagues. This year two specialists have promised to sail with him and to assist him at his work.

FOREIGN.

Search for the Tuberculous.—The city of Strasburg, Germany, is discussing the establishment of a central office to which physicians are to report all cases of tuberculosis among their patients. The central office will then search out the patients and see that they have proper food, etc., and sanatorium treatment. The expense is to be shared by the city and the state sickness insurance company.

Declaration of Cerebrospinal Meningitis.—Our Berlin exchanges are publishing a notice from the president of police asking physicians to notify the authorities of every case which even suggests the possibility of its being epidemic cerebrospinal meningitis. On account of the epidemic in Silesia and the danger of its importation into Berlin, physicians are urged to co-operate with the authorities in this way, although the official regulations call for declaration of only pronounced cases of the disease.

Prize for "Guide to Care of Infants."—A German public health society offers three prizes of about $37.50, $25 and $12.50 for an article suitable to be printed in pamphlet form for distribution among young mothers. It must be short, easily understood by the least intelligent mother or nurse, and the provisions must be the simplest possible. The text must not be more than 1,440 words, or 160 lines of nine words each. Articles to compete must be sent in anonymously, and be received before June 15. Address Prof. Dr. Lent, Cologne, Germany. The competition is open to the world and articles already published may be entered.

Accessory Sciences in the Medical Curriculum.—The disturbance in the Paris medical school, mentioned in these columns last week, is mainly due to the strictness of the examinations in physics, chemistry and natural history. The students regard these studies as secondary and begrudge the time spent over them, which they think should be devoted to the medical sciences proper. Failure to know the coefficient of the expansion of glass or Kékulé's hexagonal formula is enough to trip the fledgling physician and to set him back. The students are clamoring for a revision of the medical course of study in this respect. The French medical students are also facing much severer regulations after this year in regard to their term of compulsory military service. Hitherto they have profited by certain exemptions, but they will soon have to serve the same as all other young men, for two consecutive years.

LONDON LETTER.

The Protection of an Upright Life and Methodical Habits.

A recent case in the divorce court shows the dangers to which physicians are exposed from unscrupulous persons and also the value of keeping a complete record of all professional work. In this case the husband sought a divorce on the grounds of the adultery of his wife with the family physician. He alleged that frequent notes had passed from his wife to the physician and that they were seen together under circumstances of grave suspicion, and finally that his wife had confessed to him. An almost damning circumstance was the fact that the wife entered the witness-box and swore that she had committed adultery with the physician. Fortunately, it was shown that the husband had seduced the wife before marriage, and the judge pointed out that implicit reliance could not, therefore, be placed on her evidence. Still more fortunately, the physician was a methodical business man and kept a private diary as well as his professional day-book, from which he was able to show his movements on the days that the adultery was alleged. The records showed that these were strictly professional visits and his partner and dispenser proved that the notes sent by the wife were only requests for his attendance, and to which the partner responded when the defendant was unable.

The Teaching of Hygiene and Temperance.

A conference of physicians has been held to consider the teaching of hygiene and temperance. Sir William Broadbent, who presided, said that the object was to carry a step further the movement for the promotion of the teaching of hygiene and temperance in the elementary schools. It was initiated by a memorial to the government signed by 15,000 physicians. Sir Victor Horsley reported to the conference the continued success of the action taken by the profession. The Board of Education was meeting them. The importance of teaching the value of temperance to children was supported by Dr. Collier, president of the British Medical Association; Dr. F. W. Mott, Professor Sims Woodhead and Dr. Symes Thompson.

A Prehistoric Vesical Calculus.

At the Pathological Society Mr. S. G. Shattuck exhibited a specimen of much historical interest which proved the existence of urinary calculus at a very remote period. It was found by Prof. Elliot Smith in one of the graves of the prehistoric cemetery at El Amrah, in upper Egypt, and was presented by him to the museum of the College of Surgeons. The presence of a stone vase showed that the grave antedated by many generations the time of Menes, the first dynastic king (B. C. 4800). The age of the calculus was thus at least 7,000 years. It was found between the innominate bones of a boy, aged about 16 years, and it consisted of compact uric acid, which gave the usual chemical reactions, thickly encrusted with phosphates. Microscopic section of the uric acid "body" showed that it consisted, as usual, of coarse, pale yellow crystals radially disposed in columns. After solution of the uric acid with caustic potash a transparent matrix was revealed as under normal circumstances. The complete absence of calcium oxalate was noteworthy. In India 70 per cent. of the urinary calculi consist of this substance, which must be ascribed largely to the use of vegetable food. In the later dynasties the food of the ancient Egyptians was chiefly vegetable. It was, therefore, interesting to notice that the recent investigations on the prehistoric people showed that they

were hunters; this was shown by the discovery of hunting lances of flint in the prehistoric graves, in which clay models of kine had also been found. Immensely more interesting would the calculus have proved had it been possible to associate it with bilharziosis, which is commonly held to explain the great frequency of calculus in modern Egypt, but this after considerable trouble Shattuck was unable to do. Had the chitinous capsules of the ova been present they would certainly have been preserved and would have been discoverable. The occurrence of bilharziosis in the prehistoric age is, therefore, not yet shown.

Physicians' Bravery.

Two conspicuous examples of bravery of physicians in circumstances of great danger have lately been furnished. In both cases the heroes were Irishmen. One case occurred off the coast of Donegal. During the height of a furious gale a signal was made from the island of Innisboffin that a patient was dangerously ill. Without a moment's hesitation Dr. McDonald of Tory went down to the shore to find volunteers to row him over. The only possible conveyance was an open boat. With four plucky fishermen to man it, the doctor started. The wind was dead in their teeth, the rain descended in torrents, and a fearful sea was running high, but gradually the little boat worked its way across and the patient was attended to. On the return journey the sea was even worse and the boat, in spite of constant bailing, was soon half full of water. In this plight the men struggled for a while until a squall struck the boat and overturned it. The crew managed to cling to the keel of the boat, but the doctor was swept away by the waves and would have been drowned had not one of the men swam to him and given him an oar to cling to. Then another boat put out from the shore to give help to the men in the water. It took about an hour to rescue them. The doctor was picked up almost exhausted. In the other case the hero was Surgeon-Captain Mackenzie, who, at the annual festival of the Irish Medical Schools and Graduates' Association, was presented with the Arnot memorial medal for saving life at sea. On his way home from Mauritius, on the Ionian Sea, one of the crew fell overboard, and though the sea was running high and a strong wind was blowing, Captain Mackenzie dived, fully dressed, over the ship's side and, securing two lifebelts which were thrown to him, lashed the drowning sailor to one and retained the other himself. The order was given to stop the vessel, but owing to its speed and to the roughness of the sea, the men in the water were lost sight of, and it was forty minutes before they were taken on board in an exhausted condition.

The Indian Pasteur Institute.

The director, Lieut.-Col. Semple, has issued his fourth annual report, for the year ending August, 1904. There has been a steady increase in the number of patients treated for hydrophobia, the figures for the years 1901-04 being respectively 321, 543, 584, 612. The results also show a slight improvement—0.81 per cent. of failures against 1.03. In the cases of Europeans the treatment was uniformly successful. In Paris since 1886 the percentage of failures is 0.3. Among the Indian natives the rate works out 1.56 per cent. But it must be remembered that the circumstances are unfavorable, the bites in general are of greater severity and more frequently on naked or thinly-clad parts; there is greater delay in commencing treatment, the wounds are often insufficiently cauterized, neglected and suppurating, and finally the patients can not often afford the generous regimen desirable throughout the twenty days of treatment. In natives the average interval from infection to the first inoculation was 11.6 days; in Europeans, 7.2 days. For safety not more than three days should elapse after a bite on the head or face, and not more than five in any case. Intensive methods are used when treatment commences after the fifth day. In three cases hydrophobia supervened during the course of inoculations, and in two others within the fourteen days limit. These fatalities are not included in the statistics of failures. As in other institutes, the difficulty is in enforcing public appreciation of the paramount importance of early treatment. All but one of the fatal cases came late. Some years must elapse before full confidence is established among the native population. With the Europeans it should be otherwise, yet the director remarks: "It is not unusual for railway, postal and telegraph employes and native policemen to waste days and sometimes weeks in obtaining official sanction before setting out for treatment, or to waste an equal period in hospital waiting for their wounds to heal." The value of antirabic serum yet remains uncertain, for the routine treatment was followed in every case. Other work of the institute was the preparation of large quantities of antitetanic and antidiphtheritic serums. The work of Captain Lamb, the assistant director, on snake venoms is well known. In addition to anticobra serum two other preparations have been made—one for the venom of the *Daboia russellii* and the other for a mixture of this and cobra venom. But these serums have not yet been issued.

Pharmacology

Cleveland Society Endorses Plan.

The Cleveland Academy of Medicine passed the following resolutions April 21:

WHEREAS, The Academy of Medicine of Cleveland realizes the many evils connected with indiscriminate use of proprietary medicines by the medical profession; and,

WHEREAS, It believes that an authoritative body, appointed by the American Medical Association, is best adapted to work out a solution of this intricate problem; therefore be it

Resolved, That it endorses the creation of the Council of Pharmacy and Chemistry by the Trustees of the American Medical Association; that it has the fullest confidence in the personnel of this council; that it approves the general plans and the ten rules governing the admission of articles already formulated by the council; and that it hereby pledges to this movement its support and its hearty co-operation.

Supervision of Proprietary Articles.

Shall a physician be content to trust to the manufacturer of proprietary remedies for his knowledge of these preparations, or shall he refrain from using them because of uncertainty concerning their ingredients?

The more logical plan appears to be to devise some method by which the physician may be assured of the identity and uniformity in strength and product of medicinal articles that he may be able to use with confidence certain articles and may be on his guard against such as do not conform to medical ethics. The great body of physicians in this country have organized for their mutual interest and protection along various lines, and their efforts are now beginning to bear fruit. Why should they not invoke the organization in the work of examining into all the medicines they employ, just as well as into the more limited number in the U. S. Pharmacopeia, which is under their direction and control?

This is the plan pursued now in nearly every department of activity in which the preservation and protection of human health and life is involved. All transportation machinery, for example, is most carefully supervised and its operation controlled by strict laws and rules, for without such regulation danger to life would be too great to be endured. Recently, for example, it has been shown that the breaking of rails to which many railroad wrecks are ascribed is due to the poor quality of rails furnished by the steel trusts. As soon as this fact is generally recognized, the railroad managers will at once improve the system of testing the rails so as to exclude all poor rails in the future. In the animal industry a most thorough supervision has been in operation for many years under local, state and Federal control for the protection of the public. On every hand are found organized efforts to protect and to preserve public health. Then why not in this matter of proprietary medicines? Is there any reason why special privileges should be accorded a medicine because it is proprietary? On the contrary, because such articles enjoy a certain protection, they should be required to comply with such demands as may be necessary to insure their safe and intelligent use. This is the view taken of this question by all reputable manufacturers who have the interest of the medical profession at heart.

A Flattering Offer?

We have before us a circular containing testimonials from various members of our profession of certain proprietary preparations, and also a copy of a very attractive certificate of

stock which contains the information that the bearer is the owner of stock, etc., in the Rebekeh Chemical Co. A blank application for stock accompanies the rest of the literature, and closes with the following interesting promise which is to be made by the doctor:

"In consideration thereof, I promise to prescribe Pulvis Bis. Talc. Compound (Gray's), also Kleko Tonic (Rebekeh Chemical Co.), in cases where indicated, to the extent as suggested by the by-laws of said Rebekeh Chemical Co., and trust you will acknowledge receipt of this promptly."

The circular tells us that the Rebekeh Chemical Co. has been incorporated "with a view to issuing a quantity of common stock . . . to those interested, and you may get as high as 25 per cent. dividends. However, at any rate, you are guaranteed dividends of from 5 to 10 per cent., it depending entirely on your individual efforts as to how much more you may get, as the *physician* holds the *balance of power*. . . . Write us at once, fill out the coupon in back of this booklet and mail the same to us so that we may record it, which means that you have begun to prescribe (Gray's) Bismuth Talcum Compound, and when you have done so to the extent of $20.00 worth, that is, caused your patients to have secured it through your nearest druggists or druggist, whichever the case may be, have these prescriptions preserved for you, and when you have prescribed the required amount, or $20.00 worth, have these prescriptions O.K.'d by the druggists who have filled them, send the same in to us for record, and we will issue you one full paid share valued at $10.00 par. We guarantee the same to draw anywhere from 5 to 10 per cent. per annum. . . . Now Kleko, the great German tonic. This is a preparation that is practically new, having only been in existence about one year. It would be necessary for you to try a bottle of it in order to satisfy yourself as to its virtue. So that neither of us will be subject to any loss, send us 50c to cover the cost of packing. . . . There is nothing ever produced that has such marvelous results as Kleko in anemic conditions. Is a specific for bronchial affection, an expectorant, an emollient, no depressing effect whatever, palatable, strengthening, stimulating, contains no ingrediences that are injurious, thoroughly indicated in anemia, chlorosis, rachitis, neurasthenia and general blood degeneracy."

Here is another opportunity for him who plays at being a doctor, for him who is in practice for graft and for what he can get out of it, for him who has lost his self-respect and who no longer respects the interests of his patients. We have no doubt this flattering offer will be accepted by some doctors. It would be interesting to know just how many there are who have lost their self-respect sufficiently even to consider such an insulting proposition.

A Good By-Law.

We quote the following from the constitution and by-laws of the Mississippi Medical and Surgical Association: "SEC. 4. Any physician who shall . . . enter into a collusive agreement with an apothecary to receive pecuniary compensation or patronage for sending his prescriptions to said apothecary, or who prescribes a remedy without knowing its composition, or who shall hereafter give a certificate in favor of a patent remedy or instrument, shall be disqualified from becoming or remaining a member."

FURTHER COMMENTS QUOTED.

We quote below some expressions of opinion from various publications which discuss the general subject of secret nostrums and the plan of the Council on Pharmacy and Chemistry:

THE APOTHECARY (April): "The statement of the Council on Pharmacy and Chemistry of the American Medical Association, published below, is fraught with vital interest to both the medical and the pharmaceutical professions of this country, and is, we sincerely believe, the announcement of the beginning of a better order of things, when much that is unfair, and dishonest, and uncertain, and unethical in the practices of druggist, physician and manufacturer will be cleared away.

"Heaven knows we need a clearing up—a throwing out of rubbish—a sweeping down of cobwebs and dirt—a clearer defining of the true ethical and efficacious in medicine and pharmacy. In no other field has the faker found such encouragement. In no other profession has the element of competition so tarnished the true purpose of existence. Science and humanity still exist in great abundance, but through the widespread corrosion of greed and dishonesty the position of the humane man of science has become uncertain, anomalous.

"The American Medical Association is the proper founder of the work contemplated. The physicians—influenced largely by the manufacturers, whose purpose may or may not have been honest, and whose goods may or may not have been valuable—are largely responsible for the conditions which the A. M. A. now seeks to remedy. The adoption of therapeutic agents, the prescribing of medicines, is in their hands. The pharmacist was—and under their practices has become still more—a mere automatic purveyor of the material they designate for the cure of the sick. The pharmacist, we fear, was all too blind to the path along which he was being forced. The physician, indeed, did not realize the trend matters were taking. The impetus behind both was the manufacturer's desire to make money.

"Mind, we do not condemn the manufacturers as a whole. As a rule they were in—regarded from a commercial view point—an honest pursuit of wealth. Though handling professional articles and shaping professional destinies, they planned along up-to-date lines. And their less astute, unorganized—ah, there's where the fault lay—customers, the doctors and druggists, slipped along, too unconsciously, quite unwittingly, before them."

THE NEW IDEA. (This periodical is published by Frederick Stearns & Co., and we presume that this editorial represents their views.) April 15: "There are strong indications that the day of secrecy in medicine is dying and that ere long will dawn the era of open formulas. More and more frequently are bills, requiring publication of formulas, introduced in our state legislatures; and though these are doubtless often intended merely as gentle hints that it is time to put up more money, it is equally certain that many of them are brought forward in good faith, and therefore indicate clearly a trend of legislation. Consider also the recent action of a large proprietary house in announcing that hereafter the formulas of its preparations would be published on respective packages. Is not this significant in the highest degree?

"It is pretty well known that the American Medical Association is preparing to take a very decided stand relative to prescription proprietaries, by which those whose composition is not known, or if known in part, is stated in vague and ambiguous terms designed to mystify, shall no longer be admitted to the advertising columns of THE JOURNAL. The progressive commonwealth of New Zealand recently forbade the importation of all secret medicinal preparations, thus practically demanding publication of formulas; and though this order has been modified it has not been rescinded by any means, and the probability is that no great length of time will elapse until it is put in full force. Still other instances of almost equal importance might be cited if necessary.

"After all, why should the maker of any really meritorious secret medicine object to stating its exact composition? It is highly probable that its sale would be helped rather than hurt by such action. There are already well-known proprietary medicines of open composition which have a very extensive sale—in fact, may be said to be the most popular of their class. The commercial value of fast-selling secret medicines of real merit—and we must concede that there are such—lies not in the secret of their composition, but in the trademark rights of their owners. We shall be able to realize this more clearly perhaps if we consider two of the most valuable trademarks of the grocery business, sapolio and royal baking powder. While each of these is nominally secret in composition, it is likely that any soapmaker would have no difficulty in practically reproducing sapolio; and the exact composition of royal baking powder has been determined over and over by chemists. But as no one can sell his product under these names the monopoly in the business remains secure. Therefore it is the trademark and not the secret of manufacture that is valuable. There is no reason why it should not be equally true in medicine.

"The patent medicine manufacturer who is engaged in marketing a worthless or a dangerous preparation, however, may well look with alarm on the fast approaching day when the law shall put a stop to his nefarious business by requiring him to disclose the disgraceful secret that his 'catarrh cure' is a low-grade whisky, flavored with cubebs; or that his catarrh snuff or ointment is full of cocain; or that his soothing syrup contains a dangerous amount of morphin; and so through the whole list of 'patent' fakes. Such manufacturers have the same reason to dread publicity as do swindlers of any other sort, and that is all the more reason why an outraged public should label them for what they are by requiring them to label their merchandise as truthfully."

Correspondence

Tampon for Nose and Nasopharynx.

MINNEAPOLIS, April 18, 1905.

To the Editor:—In THE JOURNAL, April 1, page 1073, you abstract G. Lennhoff's description of a tampon for nose and nasopharynx, a long narrow strip of gauze tied at one end with a strong thread which is passed through several folds of the gauze, the string to be held by an assistant while the operator packs the gauze into the nose to the required extent. Permit me to make an addition to the technic, which makes the tampon the best possible. I have used such a tampon, which I devised five years ago, as an improvement on Ingals' many string tampon, with great satisfaction. The one difficulty is that of packing the gauze along the thread without entanglements. The best "assistant" is a tube, through which the string is passed, which serves to carry the tied end of gauze to the nasopharynx, and over which the folds of gauze are easily slipped to the required extent with dressing forceps. After a few folds have been passed into the nasopharynx the tube is withdrawn an inch or more, the folds drawn forward by the string, and tube and string held firmly while the rest of the gauze is packed. The tube is easily withdrawn and the patient has been subjected to the least possible discomfort. A decided advantage will be found in dipping the tampon in melted vaselin just before it is used.

EDWARD J. BROWN, M.D.

Association News

Announcement of Portland Committee.

The Committe of Arrangements of the Portland session have issued a circular of information to members of the American Medical Association from which we quote:

PORTLAND.

Portland is a city of approximately 150,000 inhabitants. The climate in July is delightful, the days never excessively warm and the nights always cool and refreshing. It is situated on the beautiful Willamette River, six miles from the Columbia (by trolley line) and 100 miles from the ocean. From any of the elevated points back of the city, easily accessible by car lines, can be seen the snow-capped peaks of Mount Hood, Mount St. Helens, Mount Rainier, Mount Adams and Mount Jefferson, ranging from 10,000 to 14,000 feet in altitude, presenting a view such as perhaps can not be obtained from any other city in the world.

The social features of the entertainment include: Car rides to these view points; a river excursion up the river through the great gorge of the Columbia, where the basaltic cliffs rise on either side to a height of 3,000 to 4,000 feet, over which plunge the waters of some of the most beautiful falls in the United States or the world; a railroad excursion to the Pacific Ocean and a day on the beach. These and other social events will be afforded delegates and members.

SIDE TRIPS.

Arrangements have been made for side trips for those who may desire them, at reduced rates, to Alaska, Japan and the Hawaiian Islands. The following rates have been obtained for a party of not less than twenty to each place:

San Francisco to Honolulu and return	$110.00
San Francisco to Yokohama and return	240.00
San Francisco to Hong Kong and return	270.00
Seattle or Tacoma to Alaska and return	70.00

The Alaska rate is a general excursion rate, and not limited to any number. The Alaska trip includes stops at Ketchikan, Wrangel, Douglas Island, Juneau, Skagway and Sitka, and is the most attractive scenic trip in the world to-day. If a sufficient number signify their desire to make this trip, it is probable a special steamer will be chartered to accommodate them. The fare from Portland to Tacoma and Seattle is $4.35 and $5.60, respectively. The Alaska trip takes twelve days. Dates have not yet been set.

Reservations for the trip to Honolulu, Yokohama or Hong Kong must be made before July 1. The *Korea*, a first-class Trans-Pacific steamer, leaves San Francisco, July 22. Application should be made as soon as possible to the Committee of Arrangements, so that they may know whether the required number (20) desire to avail themselves of this opportunity to take advantage of these greatly reduced rates.

Cloud Cap Inn is at the snow line of Mount Hood. A trip to this place, situated at the foot of the glacier of Mount Hood, at an elevation of 7,000 feet, is easily made from Portland at small expense of money and time. The trip can be made from Portland to Mount Hood by daylight, at a round-trip fare of $9.50. Expense at the inn, $3.00 per day. Ascent of the mountain to its summit can be made from this point in one day. The route is by rail to Hood River; thence twenty-seven miles by stage to the inn. The stage trip is through magnificent forests and amid continuous mountain scenery unsurpassed in the world.

HOTEL ACCOMMODATIONS.

Portland is well supplied with hotel accommodations; but on account of the great number of people who will attend the Lewis and Clark Fair it would be well for all intending visitors to secure rooms in advance through the Committee of Arrangements. The committee having this in hand expect to secure rooms sufficient to meet all requirements of our visitors and by an organized messenger service to be able to locate them promptly on arrival. Rates will probably be a slight advance on ordinary charges, but we intend to see that they are not excessive in any case.

Address all communications to Dr. K. A. J. Mackenzie, chairman of the Committee of Arrangements, Portland, Ore.

Indiana's Route to Portland.

Drs. F. C. Heath and F. B. Wynn, Indianapolis, have arranged for through sleeping cars to leave Indianapolis June 30, 11:50 p. m., to join the Yellowstone Park Special leaving Chicago 11:00 a. m. July 1 and to arrive in Portland July 10, 11:30 a. m. The return will be over the Canadian Pacific, leaving Portland July 17 and reaching Indianapolis July 25, 3:40 p. m.

Marriages

JAMES R. GRAHAM, M.D., Allen, Neb., to Miss Beryl Hathaway of Manning, Iowa, April 2.

LEON MOYE, M.D., Adrian, Ga., to Miss Katherine Westbrook, of Atlanta, Ga., April 12.

ROBERT ALPHA WESTON, M.D., Anita, Iowa, to Miss Hattie Bovee, at Atlantic, Iowa, April 12.

HIRAM R. STILLWELL, M.D., Denver, Colo., to Miss McClintock of Los Angeles, Cal., at Denver.

PERRY ENGLE, M.D., to Mrs. Mary C. Barker, both of Newton, Iowa, at Des Moines, Iowa, April 12.

FRANK KELLS BOLAND, M.D., Atlanta, Ga., to Miss Mollie Lelia Horsely of West Point, Ga., April 25.

LUTHER MARTIN LEISENRING, M.D., Placerville, Cal., to Miss Ethel Cora Wilcox of Omaha, Neb., April 26.

CARLETON MITCHELL, M.D., New Orleans, to Miss Kate Ronaldson of Baton Rouge, La., at Jackson, Miss., April 11.

Deaths

Ernest J. Mellish, M.D. Rush Medical College, Chicago, 1886, a member of the American Medical Association, American Association for the Advancement of Science, Cook County Hospital Alumni Association, Chicago Medical Society, State Medical Association of Texas, El Paso County Medical Society and Physicians' Club of Chicago; fellow of the Chicago Surgical Society, formerly instructor in surgery, Rush Medical College; surgeon to the Union Hospital and attending assistant gynecologist St. Joseph's Hospital, Chicago; surgeon to the Hotel Dieu, El Paso; prominent as a surgeon and an anesthetist; who was obliged to leave Chicago for Texas on account of ill health, three years ago, died at his home in El Paso, April 24, from tubercular meningitis.

William Wallace Burns, M.D. University of Louisville Medical Department, 1843, a member of the American Medical Association, twice president and three times mayor of Polo, Ill.; for 27 years a member of the local school board; commissioned surgeon in both the Mexican and Civil wars, one of the oldest and most prominent practitioners of northern Illinois, died at his home in Polo, April 18, from senile debility, after an illness of several weeks, aged 83.

Patrick J. Lynch, M.D. New York University, New York City, 1857; chief of clinic for seven years to Dr. Valentine Mott; a member of the American Medical Association, New York State Medical Association, New York County Medical Society, New York Academy of Medicine, Physicians' Mutual Aid Association and Medical Union, died at his home in New York City, April 21, aged 76.

William Bryant Small, M.D. Bellevue Hospital Medical College, New York City, 1888, a member of the American Medical Association; president of the Maine Academy of Medicine and Science; member of the Maine Medical Association and Androscoggin County Medical Society, attending physician to the Central Maine General Hospital, Lewiston, died at his home in that city, April 13, aged 41.

Charles M. Taylor, M.D. Transylvania University Medical Department, Lexington, Ky., 1856, formerly of South Bend, Ark., assistant superintendent of the Kentucky State Asylum, surgeon and assistant surgeon-general in the Confederate service during the Civil War, died at his home in Little Rock, Ark., April 15, after a brief illness, aged 72.

John Herald, M.D. Faculty of Medicine of Queen's University, Kingston, Ont., 1884, a prominent practitioner of Kingston, and professor of clinical medicine and dermatology in Queen's University, died at the Toronto General Hospital, February 13, after an operation for the removal of gallstones, aged 49.

J. Lee Adams, M.D. University of Georgetown Medical Department, Washington, D. C., 1868, chief of the claims division of the United States Internal Revenue Bureau, died at the Emergency Hospital, Washington, D. C., April 17, from kidney disease, after an illness of three weeks, aged 63.

Isaac S. Weyand, M.D. Department of Medicine of the University of Pennsylvania, Philadelphia, 1866, formerly mayor of Belle Fourche, S. D., committed suicide in Denver, Colo., by opening an artery in his leg, April 20, while despondent because of indictment for illegal use of the mails.

J. Wadsworth Terry, M.D. Medical Institution of Yale College, New Haven, Conn., 1862, a surgeon during the Civil War; a member of the American Medical Association, and of the Medical Society of the State of New Jersey, died at his home in Englewood, N. J., April 10, aged 71.

James L. Day, M.D. Medical Department of the University of Tennessee, Nashville, 1885, of Lebanon, Mo., for two years an acting assistant surgeon in the Army, serving in the Philippine Islands, died from disease of the brain at a sanitarium in Tecumseh, Okla., April 10, aged 40.

Benjamin Haile Matheson, M.D. Medical College of the State of South Carolina, Charleston, 1855, surgeon in the Confederate service during the Civil War, died in Gainesville, Fla., March 29, after an illness of more than three years, from nephritis, aged 78.

James J. Giltenan, M.D. Cincinnati College of Medicine and Surgery, 1867, of Chicago; for a long time connected with the Department of Health as medical inspector, died in Alexian Brothers' Hospital, April 20, after an illness of several weeks, aged 62.

Byron J. De Witt, M.D. Medical Department of the University of Buffalo, 1850, for many years a member of the American Medical Association; a surgeon in the Army during the Civil War, died at his home in Oswego, N. Y., April 18, aged 78.

Willard H. Coffron, M.D. University of Georgetown Medical Department, Washington, D. C., 1888, formerly professor of chemistry at his alma mater, died at his home in Grindstone City, Mich., and was buried April 11, aged 44.

Henry C. Sloggett, M.D. London, 1878, superintendent of the Oahu Insane Asylum, Honolulu, H. I., formerly president of the local board of health, died suddenly from cerebral hemorrhage while making a call in Honolulu, March 24.

Edward Moeller, M.D. Examination, New Jersey, 1876, formerly of Newark, N. J., died at his home in Baltimore, March 9, aged 72. He was surgeon of the Twenty-seventh Pennsylvania Volunteer Infantry in the Civil War.

N. Newlin Stokes, M.D. Jefferson Medical College, Philadelphia, 1854, for many years one of the board of managers of the New Jersey State Hospital, Trenton, died at his home in Moorestown, N. J., April 19, aged 72.

Calvin M. Boswell, M.D. Willamette University Medical Department, Salem, Ore., 1870, the pioneer physician of Colfax, Wash., died at his home in that city, April 8, from tuberculosis, after an illness of a year, aged 60.

Thomas B. Gordon, M.D. Missouri Medical College, St. Louis, 1889, formerly of Mechanicsburg, Ill., died at the Illinois Central Hospital for the Insane, Jacksonville, April 10, after an illness of several years, aged 42.

Fayette Coleman Clark, M.D. Rush Medical College, Chicago, 1897, of De Smet, S. D., died from cerebral hemorrhage at the home of his parents in St. Charles, Minn., April 11, after an illness of five weeks, aged 30.

Wright J. Chittock, M.D. University of Michigan Department of Medicine and Surgery, Ann Arbor, 1882, died at his home in Jackson, Mich., April 14, from pneumonia, after an illness of only three days, aged 48.

Wiley L. Dixon, M.D. University of Louisville Medical Department, 1894, formerly of Morganfield, Ky., died at his home in Clarkston, Mo., March 1, from pneumonia, after an illness of six weeks, aged 36.

Elton W. Townsend, M.D. Vanderbilt University Medical Department, Nashville, Tenn., 1905, died at his home in Princess Anne, Md., April 15, from cerebrospinal meningitis, after an illness of two days.

M. L. Meriwether, M.D. University of Louisville Medical Department, 1847, the oldest practitioner of Greene County, Ark., died at his home in Paragould, April 15, from senile debility, aged 76.

John Saunders Williams, M.D. New York University, New York City, 1860, assistant surgeon in the Confederate service during the Civil War, died at his home in Gladys, Va., April 9, aged 69.

James Masten, M.D. Years of Practice, Pennsylvania, the oldest practitioner of Tioga County, Pa., died at his home in Westfield, April 14, from cancer, after an illness of a year, aged 77.

Eli Dimock, M.D. New York University, New York City, 1844, a member of the Ohio State Medical Society, died at his home in Dupont, Ohio, March 12, from senile debility, aged 82.

Courtney L. Smith, M.D. Rush Medical College, Chicago, 1879, died at his home in Aurora, Ill., from labioglossopharyngeal paralysis, April 15, after an illness of several months, aged 47.

Benjamin Brooke Temple, M.D. Medical College of Virginia, Richmond, 1860, surgeon in the Confederate service during the Civil War, died at his home in Danville, Va., March 11, aged 66.

Albert Horatio Webb, M.D., of Lexington, a member of the Davidson County (N. C.) Medical Society, died in Salem, N. C., April 2, from pneumonia, after a short illness, aged 64.

James Carter Ellis, M.D. Louisville National Medical College, 1897, died at his home in Anderson, Ind., April 14, from tuberculosis, after an illness of several months, aged 33.

Charles W. Hilliard, M.D. Macon (Ga.) 1860, health registrar of Troy, Ala., for several years, died at his home in that city, April 15, from influenza, after a short illness.

Charles D. Brown, M.D. Rush Medical College, Chicago, 1852, for many years a practitioner of Laporte County, Ind., died at his home in South Bend, Ind., April 16, aged 79.

Patrick H. Reaney, M.D. Michigan College of Medicine and Surgery, Detroit, 1903, died at his home in Detroit, April 17, from tuberculosis, after an illness of two years.

Herman Schroeder, M.D. Cleveland Medical College, 1850, died at his home in Bloomington, Ill., April 7, from heart disease, after an illness of five years, aged 84.

Hosea B. Townsend, M.D. Berkshire Medical College, Pittsfield, Mass., 1844, a pioneer physician of Coldwater, Mich., died at his home in that city, April 13, aged 86.

J. Albro Eaton, M.D. Ohio, 1876, of Farmingdale, N. Y., died at Nassau County Hospital, Mineola, April 12, from pleuropneumonia, after an illness of two days.

Alonzo Lewis Kennedy, M.D. Massachusetts, 1875, died at his home in Brookline, Mass., April 13, from heart disease, after an illness of 18 days, aged 60.

A. B. Duncan, M.D. Medical Department of the University of Tennessee, Nashville, 1881, of Picklosi, Texas, died recently at his home near Quitman, Texas.

A. M. C. Smith, M.D. Examination, California, 1877, a pioneer of Siskiyou County, Cal., died at the home of his daughter in Lodi, April 6, aged 76.

Charles Ellsworth Hewitt, M.D. Jefferson Medical College, Philadelphia, 1891, formerly of Bradford, Pa., died in Williamsport, Pa., April 14, aged 38.

J. Mathiot Cummins, M.D. Jefferson Medical College, Philadelphia, 1858, died at his home in Larned, Kan., April 8, after an illness of four months.

Loren M. Nichols, M.D. Kentucky School of Medicine, Louisville, 1886, died at his home in Janssen, Ark., April 13, after a short illness, aged 45.

William C. Ravenel, M.D. Medical College of the State of South Carolina, Charleston, 1850, died at his home in Charleston, April 21, aged 77.

Marshall Enfield, M.D. Rush Medical College, Chicago, 1873, of Clarinda, Iowa, died at Montrose, Colo., April 12, after a long illness, aged 60.

Henry H. Parrott, M.D. M.R.C.S. England, 1842, pioneer physician of Marquette County, Wis., died at his home in Douglas, April 18, aged 85.

Albert B. Woodward, M.D. New York City, 1876, died suddenly at his home in Tunkhannock, Pa., April 10, from heart disease, aged 80.

Oliver A. Dooley, M.D. St. Louis, 1899, of Glensted, Mo., died in Miller County, Mo., February 20, after an illness of a year, aged 27.

Adolph Hoffman, M.D. Jenner Medical College, Chicago, 1896, died suddenly at his home in Oak Park, Ill., April 13, aged 43.

J. C. W. Kennerly, M.D. Savannah (Ga.) Medical College, 1855, died at his home in Mount Willing, S. C., April 13, aged 78.

Isaac W. Jones, M.D. New York University, New York City, 1857, died recently at his home in Zeb, Rowan County, N. C.

Sarah A. Henderson, M.D. Ohio, 1876, died at her home in Cleveland, Ohio, April 14, after an invalidism of 16 years.

Edgar C. Bass, M.D. Albany (N. Y.) Medical College, 1858, died at his home in Cazenovia, N. Y., April 15.

Harriet T. Dwyer, M.D. Cincinnati, Ohio, 1878, died at her home in Cincinnati, April 14, aged 85.

Deaths Abroad.

Paul Garnier, M.D., of Paris, a well-known alienist and medicolegal authority. His works on neurology, criminology and psychology were numerous and important, a number of them having received prizes from scientific societies. He had long been medical inspector of the public insane asylums of the Paris district and official medicolegal expert to the Paris courts. He was one of the experts summoned recently by the court of Vienna to examine the mental condition of the princess of Coburg. His report had not been completed when death surprised him, March 20, at the age of 57.

G. Meissner, M.D., the eminent professor of physiology and anatomy at Göttingen, whose name is associated with early investigations of the so-called touch corpuscles and of various phases of the digestion of albumin, died at Göttingen, March 30, aged 76.

J. S. A. Hjort, M.D., a prominent ophthalmologist of Christiania, Norway, originator of the open treatment after cataract operations and other operations on the eye, and author of several works on ophthalmology, died at Christiania, March 6, aged 70.

W. Schulek, M.D., professor of ophthalmology at Budapest, died March 14, aged 62.

Book Notices

PRINCIPLES OF PHYSIOLOGICAL PSYCHOLOGY. By William Wundt, Professor of Philosophy in the University of Leipsic. Translated from the Fifth German Edition (1902) by Edward Bradford Titchener, Sage Professor of Psychology in the Cornell University. Vol. I. With 105 Figures in the Text. Cloth. Pp. 345. Price, $3.00. New York: The Macmillan Co. 1904.

A distinct service has been rendered English-speaking students of mental phenomena by this translation of Wundt's "Gründzuge." The unique position which the author holds as one of the fathers of modern psychology, and as one whose contributions to psychology, physiology and philosophy have covered almost half a century, has made this detailed statement of his investigations and beliefs a veritable bulwark of science. On account, however, of the almost Kantian complexity of its style, delving into the "Gründzuge" heretofore has been a forbidding task which has turned many to the already translated "Outlines of Psychology" and to the "Lectures on Human and Animal Psychology" for an expression of Wundt's views. Titchener, a most valiant translator, as shown by his statement that the present edition is the third one translated by him but only the first one published, has mastered this difficulty of style and has succeeded in putting the text into understandable form.

Although the work as a whole is intended, Wundt states, as an exposition of his own experiences and convictions, this first volume is mostly concerned with reviewing such researches into the anatomy and physiology of the nervous system as seem to bear on psychology. One can take few exceptions to this review which covers the most important discoveries up to 1902. Modern neurologists, Luciani, Bechterew, von Monakow, Cajal and other masters, are drawn on liberally. It is interesting herein to note the influence of pathologic observation on psychology. Wundt broke away from the school of Ferrier and Munk, who thought that intelligence is a diffuse function of the whole cerebrum, and argued in his "Outlines" of 1896 that certain pathologic findings were suggestive of localization of intelligence in the frontal lobes. Now, in 1902, he states that there is direct evidence of the presence in the frontal lobes of nodal points of conduction, made up intrinsically of comparatively simple elements, but themselves of greatest importance for that complex of functional co-operation equivalent to intelligence. That occasionally lesions of the frontal lobes occur without permanent moral or intellectual injury is not sufficient to outweigh the direct evidence, says Wundt. One thinks at once of the excellent work of Phelps and wishes our author had known before he wrote that mental default is frequent when the lesion is limited to the left prefrontal lobe, the intelligence generally remaining intact when only the right lobe is involved. Altogether, there is much of value for neurologists and psychologists in this thorough ploughing up of the field of physiologic psychology represented by Wundt's "Principles," but in reading the work one earnestly wishes the ploughman had left the furrows straighter and had gathered into a clear, clean heap at the end of each all things of "muckle worth" turned up in its course.

RECHERCHES CLINIQUES ET THERAPEUTIQUES SUR L'EPILEPSIE L'HYSTERIE, ET L'IDIOTE. Compte-Rendu Service des Enfants Idiots, Epileptiques et Arriérés de Bicêtre Pendant L'Année, 1903. Par Bourneville. Avec la collaboration de J. Boyer, L. Izou, Lemaire, Reine Maugeret (Mlle.), Julian Noir, Paul-Boncour. Volume XXIV. Avec 72 figures dans le texte et 17 planches. Paper. Paris: Felix Alcan, Editeur, Boulevard St. Germain, 108. 1904.

In the entire literature of neuropathology there is nothing more remarkable than the series of volumes issued by Bourneville, written by him and his pupils or assistants. The first number appeared about 1881, and the present volume of 530 pages is the twenty-fourth—an average of one volume per year. The set constitutes almost a cyclopedia on idiocy, imbecility and epilepsy, and although they are modestly called clinical and therapeutic studies, medical literature contains no better example of the clinico-pathologic method. Nowhere is to be found such a wealth of clinical detail with autopsy findings relating to defective and epileptic children. The industry, patience and scientific acumen displayed in this collection of

papers are something to conjure with. That this mine has been worked so little by students and writers is simply a literary marvel. In quite a different branch of the subject have the labors of Bourneville and his associates been equally remarkable. How much do our present teachers of defective children know of Bourneville, his methods and results, and how often do they mention him in speech and writings? And yet for years he has been leading the van in the development of pedagogic methods for the development of defectives and has been publishing his work in these annual reports. Volume XXIV is no exception to the rule of excellence established by its predecessors. It is divided into two parts. The first, of 184 pages, is devoted to a report of Bourneville's remarkable service at the hospice of Bicêtre and contains much of interest and value to physicians in institutions where idiot and imbecile children are cared for. Part two, of 346 pages, contains 16 papers or communications of 2 to 185 pages each, with some beautiful illustrations, and some information of the personnel. The principal papers are on various forms of dwarfism (nanisme); atrophic cerebral sclerosis; imbecility, hemiplegia and epilepsy with autopsy; temperature in status epilepticus; cranial changes in cerebral atrophy and several statistical papers.

THE MEDICAL EXAMINATION FOR LIFE INSURANCE and Its Associated Clinical Methods, with Chapters on the Insurance of Substandard Lives and Accident Insurance. By Charles Lyman Greene, M.D., St. Paul, Professor of the Theory and Practice of Medicine in the University of Minnesota. Second Edition. Revised and Enlarged, with 99 Illustrations. Cloth. Pp. 466. Price, $4.00 net. Philadelphia: P. Blakiston's Son & Co. 1905.

The second edition of this work shows careful revision and change of arrangement. The rules governing selection of applicants have been greatly amplified, tuberculosis, appendicitis and diseases of the heart are even more exhaustively considered than in the first edition, and a great deal has been added to the section on the insurance of women. The bearing of occupation on the value of risks for insurance is mentioned at great length and a report of the collective investigation of the Actuarial Society of America has been added.

LIFE INSURANCE EXAMINATIONS. A Manual for the Medical Examiner and for All Interested in Life Insurance. By Brandreth Symonds, A.M., M.D., Medical Director Mutual Life Insurance Co. of New York. Cloth. Pp. 213. Price, $1.00. New York and London: G. P. Putnam's Sons. 1905.

In this bringing together of the lectures on life insurance examinations which he delivered at the University and Bellevue Hospital Medical College, New York City, the author devotes the first part of the work to introductory and historical matters. He then considers the relations of the examiner to the applicant, the bearing of disease on value for life insurance, physical examination and frauds. In two appendices the author gives an excellent summary of the chemical examination of the urine and of heart murmurs.

UNCOOKED FOODS AND HOW TO USE THEM. A Treatise on How to Get the Highest Form of Animal Energy from Food, with Recipes for Preparation, Healthful Combinations and Menus. By Mr. and Mrs. Eugene Christian. Cloth. Pp. 246. Price, $1.00. New York: The Health-Culture Co. 1904.

This volume is certainly interesting. Without discussing the uncooked food plan—which is to most thinking people only a fad—we recommend this book to those who wish to prescribe a variety in diet or to eliminate certain troubles from errors and excesses in eating. There are scores of recipes and the book might be called a cook-book were it not for the necessity of calling it an uncook-book.

AMERICAN ALKALOMETRY. Vol. IV. A Digest of Clinic Teachings 1902 and 1903. Editors, W. C. Abbott and W. F. Waugh, Chicago. Cloth. Pp. 734—VIII. Price, $2.00 net. Chicago: The Clinic Publishing Co.

This volume is a compilation in alphabetical order of the contents of the *Alkaloidal Clinic* of 1902 and 1903, thus giving articles, correspondence and editorial comment on various alkaloidal treatment subjects. Those who use these remedies will find the volume valuable. The rearrangement should have been carried further; some articles treat of several subjects and yet are placed under one heading without reference to the other subjects.

Miscellany

Opium in the Philippines.—The *Pharmaceutical Era* states that the Filipino Progress Association has sent a petition to Congress asking that power be conferred on the Philippine commission or on the Philippine legislature, soon to be organized, to enact a law for the restriction or prohibition of the sale of opium in the islands. As a means of abolishing the opium trade it is suggested that the regulations adopted in Formosa by the Japanese government be substantially followed in the Philippines. It is also claimed that our tariff laws, as applied in the Philippines, have proved no adequate barrier.

Doctors.—"No title is better than that which it represents. 'Doctor' as applied to medical men does not convey the sense of dignity or learning to any remarkable degree, because the title is exploited by a dozen or more classes of men who possess neither the one nor the other." Thus remarks the *Pharmaceutical Era*, commenting on the letter of a correspondent who would add to the list of "doctors" by conferring the title on pharmacists. "Honor must come spontaneously if it is to be worth having, and recognition of merit by the public in this way is equal to that conferred by any institution of learning or introduced by any set of resolutions."

Philanthropy and Business.—It has been shown by a number of writers that sanitary tenements may be constructed on a financial basis which will pay 4, 5 or 6 per cent. on the investment. These will be well lighted and ventilated, and may be rented at $7.00 or $8.00 a month for three or four rooms. It is stated that a company has been formed in Washington, D. C., to arrange tenements on this plan as a business enterprise, but having with it the very desirable and charitable feature that it is a work of great benefit to those who have to live in the slums. If the project is successful it ought to be extended into other cities, because it means a combination of business investment with philanthropy and civic improvement.

Etiology of Smallpox: Bacillus V.—A. Mendonça is assistant at the Bacteriologic Institute of S. Paulo, Brazil, and co-editor of the *Revista Medica de S. Paulo*, now entering on its eighth year. The issue for January 15, 1905, contains an illustrated description of a bacillus isolated by him from smallpox pustules. He states that it is extremely virulent and induces in dogs a disease closely resembling smallpox in man. Living cultures of the bacillus—which he calls the bacillus V—inoculated into dogs display decided preventive and curative properties. His research further demonstrated that the serum of animals immunized against the bacillus V seems to enhance the virulence of ordinary vaccine. The bacillus resembles the non-pathogenic pseudodiphtheria bacillus, and requires inoculation of animals for positive differentiation.

Facial Anastomosis.—Francis Villar (*Rev. Hebdom. de Laryngologie*) recommends in the surgical relief of facial paralysis the union of the facial with the hypoglossal for several reasons. While the operative difficulty is somewhat greater than in the union with the spinal accessory, the operation is not really formidable. The anastomosis with the hypoglossal avoids the danger of atrophy and paralysis of the shoulder or the synergizing of its muscles with those of the face, which are objections to the other method. The cortical center, moreover, of the facial is much more closely connected with that of the hypoglossal than with that of the spinal accessory and the bulbo-protuberential nuclei of the facial and hypoglossal are united by a posterior longitudinal bundle. The anatomic arrangement altogether is, he thinks, more conducive to the re-education of the facial movements. The importance of educational exercises, as recommended by Taylor and Clark, is insisted on as better than relying too much on electricity and massage.

Tuberculin Treatment in Belgium and Holland.—The eighth Flemish Medical Congress was held at Antwerp recently, and from the reports presented it appears that tuberculin is being used in therapeutics more extensively in Belgium and Holland

than anywhere else to date. The tuberculin used is made in Belgium, and better results are said to have been reported at the Congress than have been published by Turban, Petruschky, Goetsch, Moeller and others in regard to Koch's tuberculin. The rule is followed that all febrile reaction must be avoided. If there is any febrile reaction, three days must pass without temperature before another dose can be given. Denys produces the tuberculin by merely filtering out the bacteria. He thinks that the Koch method of heating destroys some of the properties of the serum. It is applied in the treatment not only of pulmonary tuberculosis but also of tuberculous peritonitis and laryngeal tuberculosis, lupus and tuberculous bone and joint affections. The principal communications on the subject were made by J. Gervaerts and E. Wildiers. They are reviewed in the *Münch, med. Wochft.* of Feb. 14, 1905. M. Roebroeck reported a case of caries of the fifth rib, not benefited by three different operations, but finally cured by a five-months' course of tuberculin treatment.

Insanity Witness Falls Into Awkward Blunder.—When Dr. C., said to be an insanity expert, was called in that capacity to testify in the O'Shea murder trial yesterday afternoon before Judge McEwan, the physician was treated to an embarrassing surprise.

On cross-examination, Assistant State's Attorney Olson was quoting from a book of which Dr. C. is the author, as follows:

Thus development is the intrinsic law of life, which, with the extrinsic complement (environment), gives extension and expansion along the lines of affinity limited by the specific character of the entity.

"Why, I don't know the meaning of that stuff," answered Dr. C. "It is not intelligible."

"I don't know what it is, either," answered Mr. Olson; "but you, doctor, ought to know."

"But I do not," he answered.

Mr. Olson smiled as he held up the book and said:

"Why, you wrote it yourself, doctor. I took it from your own book."

"Impossible," replied the witness. "That was never in my book."

Mr. Olson handed it to the physician, and a look of embarrassment overspread his features as he finally admitted that he had written the words.—*Chicago Tribune.*

State Boards of Registration

COMING EXAMINATIONS.

Board of Medical Examiners for the State of Texas, Austin, May 2. Secretary, M. M. Smith, M.D., Austin.

Indiana State Board of Medical Registration, State House, Indianapolis, May 2-4. Secretary, W. T. Gott, M.D., Crawfordsville.

Louisiana State Board of Medical Examiners, New Orleans, May 4-5. Secretary, Felix A. Larue, M.D., New Orleans.

Board of Medical Examiners of the State of North Carolina, May 17. Secretary, George W. Pressly, M.D., Charlotte, N. C.

Mississippi State Board of Health, Jackson, May 9-10. Secretary, J. F. Hunter, M.D., Jackson.

New York State Homeopathic and Eclectic Boards, New York, Albany, Syracuse and Buffalo, May 16-19. Chief of Examinations Division, Charles F. Wheelock, State Capitol, Albany.

Massachusetts Board of Registration in Medicine, State House, Boston, May 9-10. Secretary, Edwin B. Harvey, M.D., Room 159, State House, Boston.

South Dakota January Examination.—The report of this examination appeared in THE JOURNAL, Feb. 25, 1905, p. 646. The following questions were asked:

SURGERY.

1. Give differential diagnosis of articular rheumatism and of arthritis deformans. Give treatment of latter. 2. Describe dislocation of knee joint. Give prognosis of a complete dislocation of the femur behind the head of the tibia. 3. How would you treat a case of fracture through the symphysis of the pubis, with a rupture of the urethra? 4. Describe Colles' fracture, and differentiate it from other injuries of the wrist. 5. Describe the operation for direct inguinal hernia, and say whether there is any difference in the anatomic coverings from those in indirect inguinal hernia. 6. Give diagnosis and treatment of floating kidney. 7. Give symptoms and treatment of fracture at the base of the skull. 8. Describe the operation of ligation of the common carotid artery and tell how the collateral circulation is established. 9. Give diagnosis and different operations for stone in the bladder. 10. Give differential diagnosis of a dislocation of the shoulder and a fracture of the neck of the humerus. Give treatment of latter.

BACTERIOLOGY.

1. Describe the Klebs-Loeffler bacillus. 2. Name five pathogenic bacteria that do not stain by Gram's method. 3. Describe the Widal serum reaction. 4. Give in detail two methods of staining the Koch bacillus. 5. Name three color-producing bacteria.

ANATOMY.

1. Describe the frontal bone; the sagittal and lambdoidal sutures. 2. Describe the shoulder joint and name the bones and ligaments forming it. Give attachment of ligaments. 3. Describe the gracilis, gastrocnemius and rectus femoris muscles, giving origin and insertion of each. 4. Give origin of the renal arteries and the sacra media artery. Describe the celic axis. 5. Describe Luschka's gland, suprarenal capsules and lachrymal glands. 6. Give nerve supply of the spleen and of the gracilis muscle, and describe Meckel's ganglion and Arnold's ganglion. 7. Describe the pons varolii. 8. Describe the pericardium. 9. Describe the pancreas. 10. Describe the wrist joint, giving names and arrangement of bones.

DISEASES OF WOMEN.

1. Give symptoms, etiology, diagnosis and treatment of dysmenorrhea. 2. Give causes of uterine hemorrhage. 3. Differentiate between chronic metritis, early pregnancy, fibroid tumors and malignant disease of the uterus. 4. Mention principal causes of sterility in the female; also of vaginitis. 5. Prepare the patient, and describe a trachelorrhaphy for deep bilateral laceration with extroversion.

EYE AND EAR.

1. Give technical name, describe and treat what is popularly known as "pink eye." 2. Sympathetic ophthalmia. Give early symptoms, causes and treatment. 3. What are the causes, symptoms and treatment of chalazion? 4. Describe fully the effect of nasopharyngeal adenoids on the ear and its function. 5. What are the most common causes of pus discharge from the ear, and how would you treat it?

SKIN AND VENEREAL DISEASES.

1. Draw a clear cut clinical difference between chickenpox and smallpox. 2. Describe the seborrhea of the scalp, and give treatment. 3. Diagnose and treat impetigo contagiosa. 4. What do you know about barbers' itch, and how would you treat it? Differentiate it from eczema and from impetigo. 5. Give a clinical picture of erysipelas and treatment. 6. Give the history and description of syphilitic dermatitis. 7. Differentiate hard and soft chancre, and give their respective treatments. 8. Give history, diagnosis and treatment of gonorrhea in men. 9. Enumerate causes of orchitis, and how would you treat it? 10. How would you treat a case of gleet?

CHEMISTRY.

1. What does a chemical formula represent? 2. Define deliquescence, efflorescence, valance. 3. What is meant by an allotropic modification of an element? Give an example. 4. Give the flame test for potassium and sodium. 5. Name three abnormal constituents of urine frequently found, state their clinical significance, and give chemical test for each. 6. How would you detect sugar in urine? How estimate the daily quantity? 7. What is a disinfectant? Name some. 8. How can you prove the presence of free iodin? 9. What is formed when sulphur burns? 10. Give chemical antidote for poisoning by lunar caustic. Also its chemical name and formula.

HOMEOPATHIC THERAPEUTICS.

1. Differentiate diphtheria and follicular tonsillitis. Give two remedies for each, with indications for their use. 2. Outline your treatment of pleurisy, giving remedies you would use before and after effusion. 3. How do you treat puerperal fever? Name with indications the remedies you would administer. 4. Differentiate aloes, podophyllum and mercurius in diarrheas. 5. On what indications would you administer arsenicum, graphites and sulphur in eczema? 6. Diagnose and treat a case of scarlet fever. Also give two of the complications most likely to occur. 7. Name, with indications for its use, what you consider the most prominent remedy in the treatment of cholera morbus. 8. Describe a clinical case fully in which you would prescribe cuprum. 9. Diagnose and treat earache in an infant. 10. Name, with indications, two remedies for chronic constipation.

MEDICAL JURISPRUDENCE.

1. Define idiocy, imbecility, cretinism. 2. What is monomania? Name and define two common forms. 3. What are the duties of a coroner's inquest? 4. How would you diagnose rigor mortis from hysteria, catalepsy, apoplexy and epilepsy? 5. What are the disabilities of an unlicensed practitioner of medicine?

OBSTETRICS.

1. Describe the third stage, and your management of the same, in an ordinary case of labor. 2. Define involution. When should it be complete, and what conditions may retard it? 3. Give early diagnosis in breech presentation. What the danger? Give method of delivery when interference is necessary. 4. Give principal causes and treatment in rupture of the uterus. Also rupture of cervix. Also rupture of perineum. 5. Describe manner of applying forceps with head in upper strait; and when you would use them. 6. Describe a case of phlegmasia alba dolens, giving diagnosis, time of occurrence, cause, termination and treatment. 7. Differentiate ovarian cyst, ascites and pregnancy at beginning of fifth month. 8. Name the diameters of the fetal head and give average measurements at full term. 9. Describe a case of puerperal fever, giving cause, time of invasion, symptoms, course and anatomic appearance on postmortem examination, death occurring after three weeks. 10. Name and describe fully the contents of the uterus at full term, before labor begins, detailing the presentation and position of the child most frequent, in an uncomplicated, healthy case.

GENERAL PATHOLOGY.

1. Describe lardaceous degeneration and give synonyms. 2. Name the principal pathogenic bacteria. 3. Define the word tumor. 4. Define anemia, agiobulism and achromatosis. 5. Define chlorosis, leucocytosis and leucocythemia.

REGULAR THERAPEUTICS AND PRACTICE.

1. Define volt, ampere, ohm, and give Ohm's law. 2. Is the ampere used in electrotherapeutics to measure dosage? 3. Is

the Roentgen ray an electrical therapeutic agent? 4. Would you give KI in tablet, powder or pill? Why, or why not? 5. What is the best solution for hypodermoclysis? 6. Which is the artery of cerebral hemorrhage? 7. Describe a case of cerebral hemorrhage. 8. Make a diagnosis of acute rheumatism, excluding similar diseases. 9. Name all the causes of neuralgia you can call to mind. 10. How would you treat a case of acute lobar pneumonia? 11. Diagnose a case of trichina spiralis, excluding similar diseases. 12. Sketch a typical ammonio-magnesian phosphate crystal. 13. Make a drawing of a probable microscopic field containing tubercle bacilli —×1000. 14. What would you say ailed a patient aged 55 years if you found the following facts: Pulse 70, temperature 98.5, laborious respiration, abundant purulent sputum, barrel-shaped thorax, percussion note full and clear over whole of both lungs, but not tympanitic, area of cardiac dullness reduced, rough vesicular breathing, excessively prolonged expiration, sonorous râles and pulmonary second sound accentuated?

ECLECTIC MATERIA MEDICA, THERAPEUTICS AND PRACTICE.

1. Name three drugs belonging to each of the following classes: Narcotics, diaphoretics, sedatives. 2. Name the official preparations of gold, and describe its therapeutic uses. 3. What is the adult dose of (a) atropin sulphate, (b) strychnia sulphate, (c) tincture of cantharides? 4. How is nitrite of amyl administered, and for what purpose? 5. Give the common name, therapeutic uses and dose of sodium sulphate. 6. Write a prescription containing tincture of digitalis and tincture nitroglycerin, with the proper dose for a child of six years. 7. Give symptoms and treatment of an uncomplicated case of sciatica. 8. Mention the salts of lithium, and give doses and uses. 9. Name the official preparations of copper, and give dose of each. 10. Give the symptoms you would expect to find where an overdose of chloral hydrate had been taken, and your treatment in such a case.

PHYSIOLOGY.

1. Describe the normal pulse, and give the average rate during infancy, youth and old age. 2. Describe the action of the kidneys. 3. What are the normal constituents of the urine? 4. Describe rigor mortis. Also tetanus. 5. What is osmosis? Give an example. 6. In what respect does the temperature differ in old age from that in adults? 7. What is the normal ratio of heart pulsations to respiration in a healthy adult? 8. In what respect do fresh blood stains differ from older blood stains? 9. What is color blindness, and what colors are most commonly indistinguishable by a person so affected? 10. Describe the physical characteristics of cartilage, and give illustrations of temporary and permanent cartilage.

The Public Service

Navy Changes.

Changes in the Medical Corps, U. S. Navy, for the week ending April 22, 1905:

Tolfree, H. M., asst.-surgeon, ordered to report to the Surgeon General April 28 for a course of instruction at the Naval Museum of Hygiene and Medical School, Washington, D. C.

Dennis, J. B., surgeon, detached from the *Detroit* and ordered to Philadelphia for special duty, and thence to Washington, D. C., to report to the Surgeon General.

Ledbetter, R. E., P. A. surgeon, detached from the *Dixie* and ordered to the *Detroit*.

Porter, F. E., asst.-surgeon, detached from the Naval Hospital, Norfolk, Va., and ordered to the *Dixie*, sailing from New York about April 26.

Sturt, A., P. A. surgeon, ordered to the Naval Hospital, Chelsea, Mass., April 24.

Geiger, A. J., asst.-surgeon, detached from the Naval Station, Port Royal, S. C., and ordered to the *Chesapeake*.

Dean, F. W. S., surgeon, detached from the Naval Station, Olongapo, P. I., and ordered to the *Frolic*.

Oman, C. M., asst.-surgeon, detached from the *Frolic* and ordered home.

Owens, W. D., and Chapman, R. B., asst.-surgeons, detached from the Naval Hospital, Mare Island, Cal., May 12, and ordered to the Asiatic Station, via the *Lawton*.

Strite, C. E., asst.-surgeon, detached from the Naval Hospital, Norfolk, Va., and ordered to the Asiatic Station, via the *Lawton*.

Mink, O. J., asst.-surgeon, detached from the Naval Hospital, New York, and ordered to the Asiatic Station, via the *Lawton*.

Neilson, J. D., and Munson, F. M., asst.-surgeons, detached from the Naval Station, Guam, L. I., and ordered home to wait orders.

Stoops, R. E., asst.-surgeon, detached from the *Pensacola*, May 12, and ordered to the Asiatic Station, via the *Lawton*.

McLear, H. T., asst.-surgeon, detached from the Naval Hospital, Boston, April 29, and ordered to the Naval Station, Guam, L. I., via the *Solace*.

Clifford, A. B., asst.-surgeon, detached from the Navy Yard, New York, April 29, and ordered to the Naval Hospital, Canacoa, P. I., via the *Lawton*.

Smith, H. W., asst.-surgeon, detached from the Naval Museum of Hygiene and Medical School, Washington, D. C., and ordered to the Naval Hospital, Canacoa, P. I., via the *Lawton*.

Wickes, G. L., asst.-surgeon, detached from the *Lancaster*, April 29, and ordered to the Asiatic Station, via the *Solace*.

Berryhill, T. A., surgeon, detached from the *Oregon* and ordered home to wait orders.

Nash, F. S., surgeon, ordered to the *Oregon*, via the *Lawton*, May 15.

Public Health and Marine-Hospital Service.

List of the changes of station and duties of commissioned and non-commissioned officers of the Public Health and Marine-Hospital Service for the seven days ending April 19, 1905:

Carrington, P. M., surgeon, granted leave of absence for one month and fifteen days from May 2.

Trask, J. W., asst.-surgeon, relieved from duty at Chicago and directed to proceed to Washington, D. C., and report at the Bureau for duty.

Robertson, H. McG., asst.-surgeon, detailed as inspector of unserviceable property at the Hygienic Laboratory, Washington, D. C.

Collins, G. L., asst.-surgeon, bureau telegram of April 5, 1905, granting Assistant Surgeon Collins an extension of leave of absence for five days from April 6, 1905, amended to read three days.

Duke, B. F., acting asst.-surgeon, granted leave of absence for two days from April 20.

Hamilton, H. J., acting asst.-surgeon, granted leave of absence for six days from April 24.

Jackson, J. M., Jr., acting asst.-surgeon, granted leave of absence for seven days from April 16.

Kurtz, W. E., acting asst.-surgeon, granted leave of absence on account of sickness, for sixteen days from March 25.

Health Reports.

The following cases of smallpox, yellow fever, cholera and plague have been reported to the Surgeon General, Public Health and Marine-Hospital Service, during the week ended April 22, 1905:

SMALLPOX—UNITED STATES.

Florida: April 8-15, Jacksonville, 5 cases; West Tampa, 2 cases.
Illinois: Chicago, April 8-15, 9 cases.
Kansas: Topeka, April 1-8, 2 cases; in 46 counties, March 1-31, 1,123 cases, 5 deaths.
Kentucky: Louisville, April 6-13, 3 cases.
Louisiana: New Orleans, April 1-15, 39 cases.
Maine: Portland, April 1-8, 1 case.
Michigan: Ann Arbor, April 1-8, 1 case (imported); April 8-15, Detroit, 1 case; Grand Rapids, 2 cases; at 42 localities, March 25-April 1, present.
Missouri: St. Louis, April 8-15, 24 cases, 1 death.
New York: New York, April 8-15, 2 cases, 1 death.
Ohio: Cincinnati, April 7-14, 1 case.
South Carolina: Charleston, April 8-15, 2 cases; Greenville, April 1-8, 3 cases.
Tennessee: Nashville, April 8-15, 1 case.
Washington: March 1-31, Mason County, 1 case; Snohomish County, 2 cases.
Wisconsin: Milwaukee, April 15, 8 cases.

SMALLPOX—INSULAR.

Philippine Islands: Manila, Feb. 18-25, 2 cases, 1 death.

SMALLPOX—FOREIGN.

Argentina: Buenos Ayres, Jan. 1-31, 28 deaths.
Brazil: Rio de Janeiro, March 19-26, 4 cases, 5 deaths; Bahia, March 11-25, 16 cases, 2 deaths.
Great Britain: March 18-25, London, 3 cases; Birmingham, 1 case; Cardiff, 2 cases; March 25-April 1, Liverpool, 1 case; Southampton, 9 cases; contacts from an imported case.
India: Bombay, March 14-21, 143 deaths; Calcutta, March 11-18, 9 deaths; Karachi, March 12-19, 15 cases, 2 deaths; Madras, March 11-17, 5 deaths.
Mexico: City of Mexico, April 1-8, 4 cases, 3 deaths.
Russia: Moscow, March 18-25, 4 cases, 4 deaths.
Straits Settlements: Singapore, Feb. 25-March 4, 1 death.
Uruguay: Montevideo, Feb. 6-24, 56 cases, 8 deaths.

YELLOW FEVER.

Brazil: Rio de Janeiro, March 19-26, 14 cases, 3 deaths.
Ecuador: Guayaquil, March 21-28, 4 deaths.
Panama: Colon, Jan. 23-April 2, 6 cases, 3 deaths; Panama, Jan. 1-March 28, 44 cases, 18 deaths.

CHOLERA.

India: Calcutta, March 11-18, 30 deaths.

PLAGUE—INSULAR.

Philippine Islands: Manila, Feb. 18-25, 1 case, 2 deaths.

PLAGUE—FOREIGN.

Africa: Cape Colony, March 4-11, 4 cases, 3 deaths.
Arabia: Aden, March 17-24, 45 cases, 34 deaths.
Argentina: San Nicolas, March 18-30, present.
Brazil: Rio de Janeiro, March 19-26, 1 case, 1 death.
Chili: Atacama, March 16, present; Coplapo March 15, present; March 16, Port Mont, present; Valparaiso, present.
India: General, March 4-11, 52,250 cases, 45,541 deaths; Bombay, March 14-21, 648 deaths; Calcutta, March 11-18, 405 deaths; Karachi, March 12-19, 102 cases, 91 deaths; Rangoon, March 18, increasing.
Peru: March 12-19, Chiclayo, 23 cases, 10 deaths; Guadalupe, 1 case, 1 death; Lambayeque, 1 case; San Pablo, 2 cases, 4 deaths; Mollendo, 11 cases, 4 deaths; Lima, 2 cases, 2 deaths.

Medical Organization

Kansas.

JEFFERSON COUNTY MEDICAL SOCIETY.—Subject to call, 13 physicians of the county met at Oskaloosa, March 15, adopted the standard constitution and by-laws and perfected the organization of a county medical society, electing the following officers: Dr. Albert G. Smith, Oskaloosa, president; Dr. Edgar C. Rankin, McLouth, vice-president; Dr. W. A. Aitken, Valley Falls, secretary; Dr. Al. D. Lowry, Ozawkie, treasurer; Dr. George W. England, Valley Falls, delegate to state society, and Drs. Stephen E. Smith, Grantville; J. R. Mains, McLouth, and Samuel Johnston, Oskaloosa, censors.

Michigan.

MECOSTA-NEWAYGO MEDICAL SOCIETY.—At a special meeting of the medical societies of these two counties, held at Big Rapids, January 13, consolidation was effected under the above title. Dr. Benjamin F. Brown, Morley, Mecosta County, was elected president; Dr. Willard A. Whitney, Big Rapids, Mecosta County, first vice-president; Dr. John W. McNabb, Fremont, Newaygo County, second vice-president, and Dr. Arthur A. Spoor, Big Rapids, secretary-treasurer.

FIRST COUNCILOR DISTRICT MEDICAL SOCIETY.—The first annual meeting of this society was held in Detroit, February 20. Dr. Leartus Connor, Detroit, district councilor, called the meeting to order. Dr. Charles T. Southworth, Monroe, was elected temporary chairman, and Dr. Guy L. Connor, Detroit, temporary secretary. The committee on organization recommended that the executive committee be composed of the secretaries of the various county societies, and that the president and secretary of the district society be the president and secretary of the medical society of the county in which the meeting is held.

Missouri.

COLE COUNTY MEDICAL ASSOCIATION.—On April 4 a meeting of the association was held in Jefferson City, at which Dr. J. N. McCormack delivered an address on standard reorganization.

JASPER COUNTY MEDICAL SOCIETY.—The society held its regular meeting at Joplin, April 8, with a large attendance from surrounding counties. Dr. J. N. McCormack spoke on medical organization. The meeting closed with a banquet at St. John's Hospital.

BATES COUNTY MEDICAL SOCIETY.—Pursuant to call of the president, Dr. Edward N. Chastain, Rich Hill, a special meeting of this society was held in Butler, April 10, to hear addresses on organization by Drs. J. N. McCormack and Jabez N. Jackson, Kansas City, president of the state association.

MONTGOMERY COUNTY MEDICAL SOCIETY.—Physicians of the county met at Wellsville, April 12, and organized a county medical society on the standard plan, with the aid of Dr. Woodson Moss, Columbia, councilor for the sixth district. Dr. J. Luther Jones, Jonesburg, was elected president; Dr. M. M. Wheeler, High Hill, secretary, and Dr. George E. Muns, Montgomery City, treasurer.

VERNON COUNTY MEDICAL SOCIETY.—Physicians of the county met at Nevada, April 8, and after listening to an explanation of the plan of organization by Dr. J. N. McCormack, formed a county society and adopted the standard constitution and by-laws. The following officers were elected: President, Dr. Henry C. Jarvis, Schell City; vice-president, Dr. Edgar A. Dulin, Nevada; secretary-treasurer, Dr. Thomas B. Todd, Richards; censors, Drs. W. T. Bohannon, George O. Wilson and Samuel A. Johnson, all of Nevada.

CLINTON COUNTY MEDICAL SOCIETY.—Physicians of the county met at Plattsburg, April 11, and after talks by Dr. Elijah H. Miller, Fayetteville, councilor of the third district, and Dr. J. N. McCormack, organized a county society on the standard plan and elected the following officers: President, Dr. John Sturgis, Perrin; vice-president, Dr. Stephen D. Reynolds, Gower; secretary-treasurer, Dr. E. A. Colley, Plattsburg; censors, Drs. Robert W. Rea, Plattsburg; John C. Starks, Gower, and R. J. Woods, Trimble, and delegate to the state association, Dr. Robert W. Rea, Plattsburg.

ANDREW COUNTY MEDICAL ASSOCIATION.—At a meeting of the physicians of the county held at Savannah, April 12, Dr. J. N. McCormack addressed the meeting on organization, and a county association was formed on the standard plan with the following officers: Dr. David B. Bryant, Savannah, president; Dr. Oscar T. Bloomer, Rochester, vice-president; Dr. Clarence O. Jefferies, Savannah, secretary-treasurer; Dr. Elijah C. Bennett, Bolckow, delegate to the state association; Dr. Warren E. Danley, Avenue City, alternate, and Drs. William H. Bailey, Savannah; William M. Kerr, Savannah, and Ezekiel Houston, Savannah, censors.

LIVINGSTON COUNTY MEDICAL ASSOCIATION.—This association was reorganized at Chillicothe, March 22, with the following officers: Dr. David Gordon, Chillicothe, president; Drs. William A. Swope, Wheeling, and O. L. Alberty, Dawn, vice-presidents; Dr. John F. Cherrington, Chillicothe, secretary; Dr. Byron N. Stevens, Chillicothe, treasurer; Dr. G. W. Hutchison, delegate to the state association, and Dr. Reuben Barney, alternate.——Representative physicians from Livingston, Daviess, Mercer, Caldwell, Grundy, Linn, Sullivan and Carroll counties met with the association at Chillicothe, April 13, listened to an address by Dr. J. N. McCormack on the standard plan of organization and the benefits to be derived therefrom, and discussed the advisability of adopting this plan.

Texas.

LAVACA COUNTY MEDICAL ASSOCIATION.—This society has been reorgnaized at Hallettsville with the following officers: Dr. J. D. Gray, Shiner, president; Dr. Absalom A. Ledbetter, Hallettsville, vice-president; Dr. Arthur L. Fuller, Hallettsville, secretary-treasurer, and Dr. William E. Drisdale, Yoakum, delegate to the state association.

LIMESTONE COUNTY MEDICAL ASSOCIATION.—Dr. Garland B. Foscue, Waco, councilor of the twelfth district, met with the physicians of the county at Groesbeck, March 23, and effected a permanent county organization on the standard plan, with the following officers: Dr. Reuben B. Jackson, Mexia, president; Dr. William W. Brown, Groesbeck, vice-president, and Dr. George W. Stone, Thornton, secretary-treasurer.

Georgia Adopts Reorganization Plan.

The Medical Association of Georgia began its annual session at Atlanta, Wednesday, April 19, 1905, with the largest attendance in its history, and a program covering three days of interesting scientific work. The meeting began its labors on the last day of the Anti-Tuberculosis League in the same city, and this contributed to the increased attendance, but more of it was probably due to the fact that it was known that the proposed new constitution and by-laws, which had been pending and widely discussed during the past year, would come up for final adoption or rejection.

The program made the matter of reorganization a special order for Thursday evening. As the constitution and by-laws had been published in the transactions, and had been made the subject of much good-natured controversy for months, much interest had been aroused, and all were ready for the free discussion of the questions at issue. This was pitched on the high plane befitting the important subject and the high character of the disputants on both sides. After this full and free discussion the proposed constitution and by-laws were adopted, and on the following day the state was divided into eleven councilor districts, with the following councilors as leaders of the work of organization in each:

First District, John S. Howkins, Savannah; Second District, William L. Davis, Albany; Third District, R. E. Lee Barnum, Richland; Fourth District, W. L. Fitts, Carrollton; Fifth District, Edward C. Davis, Atlanta; Sixth District, Mallie A. Clarke, Macon; Seventh District, Alfred F. Calhoun, Cartersville; Eighth District, Samuel C. Benedict, Athens; Ninth District, William B. Hardman, Commerce; Tenth District, Wyman W. Pilcher, Warrenton; Eleventh District, Jefferson D. Herman, Eastman.

William Z. Holliday, Augusta, was elected president; Roberts P. Izlar, Waycross, first vice-president, and Charles T. Nolan, Marietta, second vice-president, and Louis H. Jones, Atlanta, was re-elected secretary and treasurer for a term of five years. The next annual meeting will be held at Augusta, April 18-19, 1906.

Georgia has a strong profession, and with the interest which has been aroused in the work of local organization by the discussion during the year and at this meeting, insuring the councilors the cordial co-operation of the profession in probably a majority of the counties at the outset, the gain in membership and otherwise promises to equal that secured under this plan in any other state.

The Purpose of the County Society.

"On other occasions," says *Northwest Medicine*, "we have urged the formation of county societies where they do not now exist and where a sufficient number of physicians is available for their organization. But the most important field for united effort lies in the cities of the state, where the physicians are found in large numbers and where the county societies enroll only a portion of them. It seems to us that the most important work for these societies for the coming year is to gather into their membership every eligible, reputable physician in their midst. Thus will be established a powerful and influential body that will be in a position to secure local and state legislation in the interests of public health and sanitation beside conserving the interests of the medical profession. Whenever, by reason of enlarged membership, the society becomes unwieldy for successful scientific work, it will be timely to establish sections of smaller bodies of physicians possessing similar interests where special work can be conducted. But first of all let us assemble in the county society and make that the unit of organization."

Society Proceedings

COMING MEETINGS.

AMERICAN MEDICAL ASSOCIATION, Portland, Ore, July 11-14, 1905.

Nebraska State Medical Association, Beatrice, May 2-4.
American Proctological Society, Pittsburg, May 5-6.
American Therapeutic Society, Philadelphia, May 4-6.
Utah State Medical Association, Salt Lake, May 9-10.
Medical Society of Nevada, Reno, May 9-10.
Louisiana State Medical Society, New Orleans, May 9-11.
New Mexico Medical Society, Las Vegas, May 10.
Ohio State Medical Association, Columbus, May 10-12.
American Ophthalmological Society, Boston, May 11-12.
American Association of Physicians, Washington, May 16-17.
Arkansas Medical Society, Little Rock, May 16-17.
Illinois State Medical Society, Rock Island, May 16-18.
Missouri State Medical Assn., Excelsior Springs, May 17-18.
Montana State Medical Association, Butte, May 17-18.
Iowa State Medical Society, Des Moines, May 17-19.
New Hampshire Medical Society, Concord, May 18-19.
Medical Society of the State of N. Carolina, Greensboro, May 23-25.
Connecticut Medical Society, Hartford, May 24-25.
North Dakota State Medical Society, Grand Forks, May 24-25.
American Gynecological Society, Niagara Falls, N. Y., May 25-27.

AMERICAN ANTI-TUBERCULOSIS LEAGUE.

Annual Session, held in Atlanta, Ga., April 18-19, 1905.

The President, DR. GEORGE BROWN, Atlanta, Ga. in the Chair.

The governor of Georgia welcomed the delegates on behalf of the state; Hon. Clark Howell, on behalf of Atlanta; Dr. Willis F. Westmoreland on behalf of the State Board of Health; Dr. William Perrin Nicholson on behalf of the Georgia State Medical Association, and Dr. John Olmsted on behalf of the Atlanta physicians.

President's Address.

In the opening address, Dr. George Brown, the president, welcomed the delegates, paying them an eloquent tribute as men who for love of humanity were willing to sacrifice time and money to come to this meeting that they might help along the great work of the prevention of tuberculosis. Their mission is to plead that tuberculous sufferers might have better treatment, better laws and better attention.

Tuberculosis in the Negro.

DR. SEARLE HARRIS, Union Springs, Ala., read the first paper, in which he considered the cause and prevention of tuberculosis in the negro from a sociologic standpoint. He held that the great death rate from consumption in the negro race was due to lack of sanitation and to improper modes of life.

Susceptibility of Children to Disease.

DR. WILLIAM S. ALEXANDER, Oxford, Ohio, considered the susceptibility of children of tender ages to disease, and emphasized the care that should be exercised in rearing them until they come to an age at which they can offer vital resistance. In the discussion of this paper the question of the heredity contagiousness or infectiousness of tuberculosis was brought up and the advocates presented their views which were strongly convergent.

The Tuberculous Woman.

DR. MARY HAWES, Denver, in her paper on "The Tuberculous Woman in Colorado," made it plain that a climatic prescription was not the desideratum. It made a difference whether the consumptive woman in the west was sent there with the disease or whether she contracted the disease after she came there. The author believed that temperament, age, financial condition, etc., had rarely been given the thought which they required by eastern physicians.

State Control.

DR. ROBERT E. CONNIFF, Sioux City, Iowa, in his paper on "State Control of Tuberculous Diseases," suggested the necessity of isolation of tuberculous patients and asserted that health boards assume control of other diseases far less fearful and less deadly than tuberculosis.

The Physician's Duty in Tuberculosis.

DR. CHASE P. AMBLER, Asheville, N. C., read a paper on "The Physician's Paramount Duty to the Patient and Family in Tuberculosis." He averred that tuberculosis was not the fatal disease that many had been taught to believe, and declared that too many physicians were in the habit of keeping the truth regarding the disease from tuberculous patients. He asserted that it was within the province of the family physician to educate the family to the necessity of conditions existing in tuberculosis cases. With proper care the disease could be handled and the knowledge of its existence was better for all concerned. He insisted that:

1. Tuberculosis is not the fatal disease commonly believed.
2. While communicable, it can practically be made innocuous by the proper course on the part of the patient.
3. The chief cause of the large mortality is late diagnosis.
4. Late diagnosis is caused by indifference of patient to early symptoms and carelessness on the part of the physician consulted.
5. By thorough, systematic instruction of the patient better results can be accomplished than by medication.
6. Instructions of patient, family and friends and close observance on their part of the rules laid down will practically rob the disease of its method and means of extending.

To Overcome Spread of Tuberculosis.

DR. JAMES M. MASTERS, Newport, Tenn., presented a paper entitled "How Conditions Chiefly Responsible for the Spread of Tuberculosis Can Be Overcome." He laid especial stress on expectoration and the great harm it did in the home as well as in public places and on sidewalks, and commended the various anti-expectoration ordinances passed by muncipalities. He said that all spitters should be required to carry cups, that handkerchiefs should not be used by consumptives, and that the bacilli are expectorated and not exhaled.

Importance of Disinfection.

DR. EDWARD L. MCGEHEE, New Orleans, a member of the State Board of Health, enlarged on the importance of disinfecting any apartment occupied by tuberculous subjects. He demanded thorough disinfection of every room and every house which had been the home of a tuberculous patient, and demonstrated that germs of the disease could lie dormant in a room for years and then, when disturbed, could enter on a new campaign of disease and possibly of death. He stated that by disinfection only could the germs be annihilated.

DR. QUITMAN F. KOHNKE, New Orleans, demanded disinfection, but doubted the wisdom of a compulsory law.

The Creed of the League.

The committee on resolutions submitted its report, in which it presented the following preamble and resolutions as the creed of the league:

1. Tuberculosis is communicable, not inherited. A predisposition to this disease may be transmitted from parent to child, but not the disease itself.
2. Tuberculosis is curable. When the presence of the germ is early recognized, it may be destroyed in the individual by the adoption of proper remedial measures.
3. Tuberculosis is preventable. Two factors are essential to its development. First, the presence of the germ, and, second, a soil favorable for its development. To some extent one or both of these factors are subject to intelligent control. The disease is, therefore, to this extent preventable.
4. We respectfully recommend the appointment by this league of three physicians in each state, whose duty it will be to form state antituberculosis leagues, to invoke the aid of the profession and the state in the crusade against this dreadful disease.

Resolved, That this league respectfully transmits a copy of these resolutions to the secretary of each state society to be presented to the societies for consideration and action thereon, and asking their co-operation.

Resolved, That the object sought to be accomplished by this congress of the American Anti-Tuberculosis League is to present to the American public practical and practicable methods and measures to avoid the infection of tuberculosis, to suppress its spread, and in furtherance of this end to endeavor by education to encourage a healthful condition of living, through personal hygiene and domestic sanitation.

Resolved, further, That a committee be appointed by the chair to prepare concise and forcible leaflets, tracts, pamphlets and other literature intended for the information of the public, on the subject of tuberculosis and the manner in which it is usually acquired, how to prevent its spread by proper living, and proper sanitary care of the patient and his dwelling, and for the presentation of this subject interestingly, practically, understandingly. Such literature to be distributed widely throughout the United States, in home, store, workshop and factory.

Be it also resolved, That the committee so appointed shall be authorized to solicit funds by popular subscription to defray the expenses for carrying out the purpose of this resolution.

Presentation to President.

At the opening of the third day's session Dr. Walter F. Boggess, Louisville, presented to Dr. George Brown, the president, on behalf of the league, a three carat diamond pin, set with emeralds.

Election of Officers.

The officers selected for the coming year are as follows: President, Dr. Robert E. Conniff, Sioux City, Iowa; vice-presidents, Drs. T. V. Hubbard, Atlanta, Ga., Arthur H. Van Dyke, Atlanta, Ga., Chase P. Ambler, Asheville, N. C., Charles A. Snodgras, St. Louis, Mo., Edward L. McGehee, New Orleans, La., Mark Millikin, Hamilton, Ohio, Preston M. Hickey, Detroit, Mich., Urbane V. Williams, Frankfort, Ky., Joseph Y. Porter, Key West, Fla., Gray of New Jersey, and William J. McMurray, Nashville, Tenn.; secretary and treasurer, Dr. Walter N. Vilas, El Paso, Texas.

Entertainment.

On the evening of April 18, the delegates were entertained at a reception at the Piedmont Hotel by Dr. George Brown, the president, the officers of the league, and the ladies reception committee.——On the afternoon of the second day the delegates were the guests of Dr. Arthur H. Van Dyke, chairman of the local reception committee, at an old-time Georgia barbecue, at the Cold Springs 'Cue Club.

The next annual session will be held in El Paso, Texas.

TENNESSEE STATE MEDICAL ASSOCIATION.

Seventy-second Annual Meeting, held at Nashville, April 11-13, 1905.

(Continued from page 1307.)

Melancholia.

DR. S. T. RUCKER, Memphis, said that heredity is encountered in this disease in about 50 per cent. of the cases. Ill health, mental strain, worry over financial affairs, domestic troubles, and disappointment in love are also factors largely responsible for most cases. Auto-infection undoubtedly plays a considerable rôle in some cases. Pregnancy in primiparæ is an aggravating cause, and generally begins about the third or fourth month. The puerperal state does not so often produce melancholia as pregnancy and lactation. Several forms of agitated melancholia are occasionally associated with chronic alcoholism. The sobering up after a prolonged spree or debauch will precipitate an acute attack of melancholia, not infrequently ending in suicide. The onset of melancholia is almost always gradual. At first, it may be only a feeling, which takes no definite shape, and there may be no delusions. Every thought and everything in the environment had a sorrowful color. When questioned, the patient will simply say that he feels depressed or has the blues. The morbid feeling constitutes the disorder. The symptoms vary from a simple state of dejection to a state of profound depression, in which the patient is either paralyzed by the dreadful nature of his concepts, or is thrown into a state of agitated suffering, associated with marked precordial distress and peculiar pains in the back or top of the head. The author mentioned three varieties of melancholia, the acute, subacute and chronic. There is no known pathologic anatomy for melancholia. It is considered a functional disease of the brain. Melancholia can hardly be mistaken for acute mania, as in the former there is a slowing of the thought process, while in the latter there is an accelerated flow of ideas, and the maniac is unusually cheerful and talkative. The prognosis in melancholia is very favorable, inasmuch as fully 90 per cent. of the cases recover. Thorough investigation, speedy separation from relatives and friends, and an early commitment to an institution for treatment should be the rule in this class of patients.

DISCUSSION.

DR. M. CAMPBELL, Knoxville, said that melancholia agitata and simple melancholia, are symptoms of one and the same disease. Melancholia itself is not, strictly speaking, a mental disease, but a symptom of a pathologic state which underlies the symptom of depression which is most prominent, whether it be an organic or functional disease. A large percentage of the cases of melancholia that are sent to hospitals for the insane do not recover. He does not think half of them get well. In treatment, he suggested a change of scene, getting away from the conditions that produced the disease, building up the patient physically and giving hypnotics to produce sleep, warm baths, etc.

DR. W. J. BREEDING, Taylors, related the history of a woman, 42 years of age, mother of eight children. An aunt in the family was insane. He saw her in the sixth week of pregnancy, at which time she was in a depressed condition. He made a diagnosis of hysteria. The woman recalled her experience during a former pregnancy, and said she could not live through this one, believing she would have a repetition of vomiting and nausea. There was no pathologic condition. She had numerous delusions up to the seventh month of pregnancy, when a miscarriage occurred; the fetus was badly deformed. It was thought she would now recover, but in two weeks she lapsed into a condition of melancholia, eked out a miserable existence for two or three months, and then committed suicide by hanging.

DR. C. P. MCNABB, Knoxville, cited two cases, in neither of which the family consented to sending the patient to a hospital. One patient had three attacks of melancholia, with three partial recoveries. The other was now in her third attack.

DR. A. F. PASCHALL, Crossland, thinks that in the case of young men advertising literature by quacks plays an important rôle in the causation of melancholia.

DR. S. S. CROCKETT, Nashville, said there is a popular impression that there is an insanity which develops in puerperal women that differs from other forms of the disease. There never was a greater mistake. Pregnancy and lactation should be regarded as one factor which may produce insanity in a woman who is otherwise predisposed to it.

DR. LOUIS LEROY, Nashville, agreed with Dr. Crockett that there is no special type of insanity peculiar to the pregnant woman. The condition has been recognized as an etiologic factor, possibly as the exciting cause of the disease, to such an extent that, even though incorrect, from the standpoint of pathology, clinically the term puerperal insanity is recognized both professionally and by the laity. The probability is that the causes are few in number: First, that the shock to the nervous system resulting from the profound changes occurring in pregnancy may bring on an attack which is impending or accentuate the nervous disturbance otherwise held under control. On the other hand, many cases are the result of auto-intoxication.

Diagnosis of Kidney Diseases.

DR. LOUIS LEROY, Nashville, said that in renal diseases more than in others, accurate discrimination in diagnosis is important. Failure to distinguish between parenchymatous or interstitial nephritis, or to make a snap diagnosis of nephritis from a trace of albumin without further investigation of general clinical conditions and the exclusion of some other lesions microscopically, or a repeated examination, in the absence of casts, microscopically to determine some cyclic or functional albuminuria, may render the physician a subject of ridicule for which years of careful and conscientious work can scarcely atone. While malformations of the kidneys are of great rarity, their importance in surgical cases should cause the possibility to be constantly borne in mind. The absence of one kidney or fusion of both into one mass should be considered and the presence of an organ on both sides determined, if possible, while debating the admissibility of operative procedures. It is not always possible, and frequently quite difficult, to determine the presence of the kidney when in normal position, either by percussion or palpation, especially in patients with thick abdominal walls, or large, well-developed spinal muscles. In such cases the presence of the organ may be determined by the *x*-rays, or both ureteral orifices may be determined by a cystoscopic examination, in which case the presence of two kidneys may be considered as assured, the possibility of a single kidney having two pelves and ureters being so slight as to be negligible. In case of movable kidney, however, it is usually possible to recognize the condition by palpation, sometimes assisted by percussion, and one may sometimes be surprised to find no clinical symptoms associated. With some cases the kidney readily returns to its normal position, where it remains for some time, and it may be necessary to make several examinations at different times before finding it when displaced.

Perinephritic Abscess.

DR. W. A. BRYAN, Nashville, discussed the differentiation of this form of abscess from other abdominal conditions, and reported a case. Mr. F., locomotive fireman, aged 28, has had no evidence of disease since childhood. In August, 1904, patient received a superficial burn on his left olecranon, which became infected, but healed kindly. After a few days an abscess developed with the burn. This was opened and healed. A few weeks later three or four other abscesses formed around the site of the original abscess, were opened, or ruptured, and healed. In October he began to have pains in the right lumbar region, and soon afterward quit work and went to his bed. Pain in the right side was described as a "catch"; his back ached constantly. He became distinctly septic. Liver dullness was elevated one inch in the right nipple line; right side one and one-half inches larger than the left. Enlargement of the right loin was very perceptible, and fluctuation was present; pus on aspiration; urine normal. December 15, 1904, the author operated, removing 24 ounces of pus. Patient improved, but had pain again from the beginning after the operation in his left side. Aspiration was resorted to, pus was found, and two weeks from the first operation a second one was performed, removing eight ounces of pus from the left side, after which the patient made an uninterrupted recovery and has since gained forty pounds. The pus gave a pure culture of staphylococcus aureus. There was no connection between the two abscesses.

(To be continued.)

A Postoffice Exposure

FRAUDULENT USE OF U. S. MAILS.

Circuit Court Decision in Case Denying Use of Mails to Lost-Manhood Advertiser.

The record in a case recently decided in the U. S. Circuit Court for the Northern District of Illinois by Judge Christian C. Kohlsaat will be found of interest to our readers. We give first an abstract and then the full text. In the text the subheadings have been added by THE JOURNAL.

For some time prior to September, 1903, T. B. Ganse had been engaged in his own name, or under the name of the Chicago Cure Company, in the mail order business for advertising, distribution and sale of certain remedies, purporting to be adapted to the permanent and effective cure of sexual diseases of men. Following a number of complaints received by the U. S. Postoffice Department, an investigation of the business was begun, with the assistance of Dr. H. W. Wiley and staff of the Department of Agriculture.

On Sept. 18, 1903, Mr. Ganse was notified that charges were pending against him to the effect that he was engaged in conducting a scheme for obtaining money through the mails by the means of fraudulent pretenses, in violation of the postal laws. A memorandum of the charges was sent him, and Oct. 12, 1903, was set for a hearing. The advertiser filed a sworn statement, in which he asserted the truthfulness of all representations he had made, and asserted that the curative qualities of his remedies had been truly stated. At the hearing of the complainant, correspondence and samples of all circulars and advertising matter, etc., were gone over.

The next procedure was a full consideration of all the data by the Assistant Attorney General of the United States, and the conclusion was reached that this Chicago Cure Company was "using the mails for obtaining money by means of false and fraudulent pretenses as to a medicine incapable of producing the benefits claimed." This report was submitted to the Postmaster General, and he duly issued a fraud order, June 2, 1904.

From this fraud order, Mr. Ganse appealed. The case was entitled, "T. B. Ganse, vs. F. E. Coyne, Postmaster, etc.," F. E. Coyne being the postmaster of Chicago, and the local authority most concerned in the enforcement of this fraud order against the advertiser. The point to be decided was apparently this: Did the officials of the government give a full and judicial hearing to all possible necessary evidence to establish the point of fraud on which the order was based.

The entire evidence of the government's investigations and of all the procedures that had been taken were given consideration by Hervey W. Booth, special master in chancery, who was ordered to report to the judge of the Circuit Court. We here acknowedge the kindness of Mr. Booth and of the U. S. District Attorney, S. H. Bethea, in furnishing a copy of the master's report, and in giving further information about the disposition of the case. This report was approved by the Federal Circuit Court, which procedure involved the dismissal of the appeal of the complainant, Mr. Ganse, for want of equity. When the status of the case had been determined thus, Mr. Ganse was indicted for fraudulent use of the mails, he pleaded guilty, and the matter was continued for sentence later.

IN THE U. S. CIRCUIT COURT FOR THE NORTHERN DIST. OF ILLINOIS, NORTHERN DIV., CHANCERY: MASTER'S REPORT.

To the Hon. Christian C. Kohlsaat, Judge of said court:

The undersigned, who was heretofore by order duly entered herein, appointed special Master in Chancery to assist the standing master, William M. Booth, to whom said cause was referred by order entered therein on the 17th day of June, 1904, to take proofs and report the same together with his conclusions, having been by order entered on Sept. 19, 1904, on account of the death of said standing master, given the same power and authority to make report of proofs and findings of law and facts as were given said standing master, respectfully reports as follows:

The undersigned as such assistant master, prior to the death of said standing master, and under his directions, caused the parties in said cause to attend before him on the 27th day of June, 1904, and on various other days subsequent thereto, as will more fully appear from the transcript of the record which is filed herewith, and thereon certain oral and documentary evidence and certain physical exhibits were adduced on behalf of the respective parties; and certain other proceedings were had; all of which documentary evidence and exhibits, together with a full, true and correct transcript and report of said oral evidence is filed herewith, and constitutes all the evidence of every description produced before the undersigned master on behalf of either of the parties to said cause.

And thereon, afterward, oral and printed arguments were submitted to said master by counsel for the respective parties, and the master, having considered the said arguments, and the said evidence and proceedings before him, has reached the following findings and conclusions.

I.—IDENTITY OF THE PARTIES.

The complainant, T. D. Ganse, is a citizen of the state of Illinois, residing in the said Northern District of Illinois, in the said Northern Division thereof; and the defendant, F. E. Coyne, is the postmaster of the United States in and for the city of Chicago, in said Northern District of Illinois, duly commissioned and acting as such.

II.—THE ISSUING OF THE FRAUD ORDER.

In September, 1903, and for some time prior thereto, the complainant had been and was engaged, either in his own name or by the name and style of "Chicago Cure Company," in a business in the nature of a mail order business for the advertising, distribution and sale of certain remedies purporting to be adapted to the permanent and effective cure of sexual diseases of men, the principal office of which business was located at said city of Chicago. In distributing his advertising matter in search of patrons, and in communicating with and sending his preparations to customers, and in collecting from them payment for medicines furnished, Ganse made extensive use of the United States Postoffice establishment and of the United States Mails.

Prior to September, 1903, various communications in the nature of complaints of the business conducted by Ganse had been received by the United States Postoffice department, and through its proper officials said department had been conducting an investigation of such business. On September 18, 1903,

by direction of the Postmaster General, the complainant was notified that charges were pending against him in the Postoffice Department at Washington, to the effect that he was engaged in conducting a scheme or device for obtaining money or property through the mails by means of false or fraudulent pretenses, representations or promises, in violation of Sections 3929 and 4041 of the United States Revised Statutes, and a memorandum of such charges was at the same time submitted to him, and a day fixed for considering the charges and complainant's reply thereto; in which memorandum the complainant's business was described as a scheme to effect the sale at an enormous profit of a combination of drugs palmed off as a wonderful discovery, by falsely representing its curative powers.

To this charge complainant filed a sworn statement in which he asserted the truthfulness of all representations made by him, and that the curative qualities of his remedies had been truly stated.

The matter came on for hearing at Washington, D. C., before Edwin W. Lawrence, the acting assistant attorney general, on Oct. 12, 1903, at which hearing the complainant was represented by his counsel. On the hearing there was submitted to the assistant attorney general various proofs and exhibits adduced in support of and in disproval of said charge, such proofs consisting in part of the several complaints before the department and correspondence connected therewith (being government's exhibits Nos. 11 to 44), also the postoffice inspector's reports in the case; also formulas submitted by complainant purporting to show the composition of his various remedies; also a complete file of all circulars and advertising matter used by the complainant; various circulars that had been distributed by him through the mails to certain customers; a number of testimonials submitted by complainant said to have been received from patrons who had been treated by him, and various medical authorities cited by complainant's counsel in support of his contention of the efficacy of the remedies.

Thereafter the government caused samples of the complainants' remedies to be procured and submitted to the Department of Agriculture for analysis. Some of these samples were already in the possession of the government, having been received from one of the complaining parties above referred to; other samples were obtained by Inspector McAfee of the Postoffice Department, through correspondence with the complainant under an assumed name. There was some delay in completing the analysis owing to the necessity of procuring these additional samples, the quantity first submitted to the Agricultural Department having been insufficient for a satisfactory analysis. Ultimately the analysis was finished, and a report of the results arrived at was submitted to the Postoffice Department, which report is in evidence before the master as government's exhibit No. 34.

Thereafter, at the request of the Postoffice Department, Dr. Wyley of the Agricultural Department furnished to the Postoffice department his opinion in writing of the efficacy of the samples of Robusto analyzed, which opinion, omitting the formal beginning and ending, is as follows:

> I beg to acknowledge receipt of your communication of the 17th inst., asking for a further statement in regard to the alleged remedy known as "robusto." I have also looked over carefully the circulars of various kinds issued by the company making this alleged remedy. Many forms of this remedy are mentioned in the circulars which we have examined. We have not had samples of "robusto" course for external use, special robusto vitalizer and developer, nor any of the forms of the alleged remedy described on the back of the reduction check No. 159670, marked in blue pencil, No. 13. I, therefore, can give no opinion respecting the efficacy of any of these substances. I beg, however, to state that, in my opinion, the samples of "robusto" which we have examined, and the results of which examination were transmitted to you in my letter of April 22, 1904, can not possibly have the properties ascribed to them in the advertising circulars of the Chicago Cure Company which you have submitted for examination. In my opinion, these remedies are practically inert. The circulars are calculated to excite groundless fears in the minds of those reading them and to develop false hopes of the benefits which are promised. Any good effect which may be noted in the patient as a result of the application of this alleged remedy is probably due to the mental condition noted above, and not to the efficacy of the remedy itself.

The case was finally considered by Mr. Goodwin, the Assistant Attorney General, and his assistant, Mr. Lawrence, on all of the above proofs, analyses, communications, formulas, testimonials submitted and medical authorities cited by Ganse's counsel, and also on evidence showing numerous other concerns selling alleged cures for lost manhood and claiming to use practically the same drugs as those shown in Ganse's formulas; and a conclusion was reached by them which was embodied in a memorandum and recommendation signed by the Assistant Attorney General, and submitted by him to the Postmaster General. This memorandum, omitting its formal beginning and conclusion, is as follows:

> This company was duly called on, Sept. 18, 1903, to show cause before this office by Oct. 12, 1903, why it should not be denied the further use of the mails in the conduct of its business, which was charged to be fraudulent within the meaning of the above-mentioned statutes. The company, in response thereto, submitted a written answer, as well as appearing by its attorney, W. Knox Haynes, Esq., of Chicago, on the day fixed for hearing, to supplement its written answer by oral argument. Careful consideration has been given this case, and samples of the company's alleged cures have been submitted to the Department of Agriculture for chemical analysis and advice.
>
> This company has for sale what it claims is a cure for "nervous debility and sexual inability," etc. To induce the unfortunate to become its patients for the treatment of such conditions, the company makes many extravagantly false and misleading representations and statements regarding the properties and efficacy of its alleged remedies. A few of these are quoted below:
>
> "NEW LIFE!! NEW HOPE!! ROBUSTO: A MAN BUILDER. WHAT ROBUSTO DOES: Robusto is a combination of remedies prepared on a scientific plan far in advance of the usual stimulating method. It is a system so planned that its powers and effectiveness increases as it progresses, until a cure is established upon a solid basis that will last for life. Those who are looking for a temporary stimulant will please pass us by. We aim to do PERMANENT GOOD, and in no case will we do injury. ROBUSTO is effective in all cases of WEAKNESS, no matter what the cause. It will BUILD UP any man who is run down, whether from sickness, overwork, dissipation, or whatever else. If you suffer from temporary exhaustion or brain fag, ROBUSTO will fit you for the duties which must be met. It has saved the day and brought business success to many a man. ROBUSTO fills out thin men, gives calm nerves, and imparts self-reliance. ROBUSTO is particularly recommended in all forms of nervous debility and sexual inability. It will stop the life waste attendant upon spermatorrhea, and restore health to the entire sexual organism. It is particularly effective in cases of atrophy, lack of power, etc. And in this respect we challenge the world for its equal. In cases of Varicocele, Hydrocele, Stricture, Gleet and Prostatic Irritation, ROBUSTO seems to have a soothing effect upon the irritated parts, while its strength-building qualities will build up such a vigorous state of health that nature will have power to eliminate the diseased tissues and establish normal health. Even in the most severe cases we suggest a little caution, and the use of ROBUSTO before resorting to instruments which are likely to carry the disease still deeper. We claim that the ROBUSTO progressive plan is as far above the old fogie drug stimulants and poisons as usually administered as sunshine is ahead of darkness. We need not go into the usual harrowing and sometimes indecent details. You will know whether or not you are up to the mark, and if you find yourself failing, or even if you have given up hope, just give ROBUSTO a trial upon the liberal terms which we name, we taking the risk. We firmly believe that there is not a man living, young or old, who is so weak that ROBUSTO will not revive him; none so strong that it will not benefit, if used at the right time. ROBUSTO will give you rich, red blood, strong nerves, active brain, and all that goes to make ATTRACTIVE MANHOOD.
>
> "ROBUSTO is NOT a stimulant, but a strength-building nerve food, with added ingredients to eliminate disease, restore the tissues and establish normal manhood upon a firm foundation.
>
> "ROBUSTO is a fixed method of treatment, consisting of the most potent remedies known to science, so combined that they increase in power and effectiveness as the system progresses.
>
> "ROBUSTO is a tonic for overworked or dissipated men. It stops life waste and restores proper strength and development.
>
> "ROBUSTO fills out thin men, brings calm confidence, clear complexion, and all that goes to make attractive manhood.
>
> "ROBUSTO is a true bracer for young men, married men, middle-aged and old men. It will revive you and put new sunshine into your life.
>
> "ROBUSTO is in every sense A MAN BUILDER.
>
> "ROBUSTO is the grandest remedial plan ever devised for the relief of SEXUAL DEBILITY. It is a combination of agencies, prepared on a fixed system, which increases in power as it progresses. The test course is merely the commencement of the *building up* process, to be consummated by the addition of other ingredients, all of which act in harmony to establish normal health without stimulation or reaction.
>
> "ROBUSTO will strike at the foundation of your trouble and rescue you from the SEXUAL SUICIDE which threatens.
>
> "You have got to TOUCH THE SPOT AND HEAL IT and this is accomplished by our PROGRESSIVE STRENGTH BUILDING PLAN, which enters into your entire system, vitalizing every nerve and fiber of your being, until almost imperceptibly and before you realize it you find yourself A NEW MAN.
>
> "During this process the sexual organs will become properly developed and strengthened. Your will power will grow, so that you will have proper SELF-CONTROL; in cases complicated with varicocele, stricture, prostatic irritations, etc., the diseased tissues will be eliminated, the irritation soothed and a healthy tone established. The nerves will become calm, the brain active, and all that miserable condition of sympathetic health, often complicated by constipation, stomach distress, liver disease and whatever else, will gradually disappear, to be replaced by the Magnetic Vigor and Self-Reliance of PERFECT MANHOOD."
>
> Samples of the company's remedies submitted to analysis by the Bureau of Chemistry of the Department of Agriculture were found to contain about 50 per cent. sugar, with the remainder composed of the active constituents, spanish flies, red pepper,

ferrous carbonate, and a bitter material which could not be identified. The active agent of these remedies is probably the Spanish flies and they are recognized as being aphrodisiacal. The conclusion of the Department of Agriculture as to the efficacy of these remedies is:

"I beg, however, to state that, in my opinion, the samples of 'robusto' which we have examined, and the results of which examination were transmitted to you in my letter of April 22, 1904, can not possibly have the properties ascribed to them in the advertising circulars of the Chicago Cure Company which you have submitted for examination. In my opinion, these remedies are practically inert. The circulars are calculated to excite groundless fears in the minds of those reading them and to develop false hopes of the benefits which are promised. Any good effect which may be noted in the patient as the result of the application of this alleged remedy is probably due to the mental condition noted above and not to the efficacy of the remedy itself."

Being convinced that it is using the mails for obtaining money by means of false and fradulent pretenses, representations, etc., as to a medicine which is incapable of producing the benefits claimed, I recommend that a fraud order be issued against this company.

This memorandum, together with a fraud order, prepared in the usual form for signature, was submitted to the Postmaster General, and on due consideration thereof, he approved the same, and signed and issued said order under date of June 2, 1904.

III.—BASIS FOR THE FRAUD ORDER.

The evidence which was before the Assistant Attorney General, and which was considered by him, and on which he based his recommendation and finding to the Postmaster General, was considered by him as satisfactory and sufficient to warrant the same.

In coming to the decision reached by him embodied in his memorandum to the Postmaster General, the Assistant Attorney General considered that the analysis made by the Department of Agriculture was a correct statement of the composition of the alleged cure; but he also further concluded that even on the assumption that the formulas submitted by Ganse correctly stated the ingredients of the cure, and assuming further that some of said ingredients might have a beneficial effect in the treatment of certain of the diseases prescribed for, nevertheless, there were numerous and material false representations in the literature of the complainant sufficient to bring the case within the fraud statutes.

Shortly after the issuing of the fraud order, counsel for the complainant called on Mr. Goodwin, the Assistant Attorney General, and requested that said order be stayed for a few days to give him an opportunity to disprove the analysis of the Department of Agriculture, which request Mr. Goodwin declined to comply with, but offered to take up the case and hear additional proofs at any time.

It does not appear that any further effort was made by counsel for complainant to secure a rehearing of the case before the Postoffice Department, or to present any further or other proofs before said department.

IV.—AUTHORITY FOR THE FRAUD ORDER.

The procedure following the hearing, consideration and determination of this matter was the usual and customary procedure of the Postoffice Department in all similar cases. Under the authority conferred by Section 161, Title IV, of the United States Revised Statutes, the Postmaster General had adopted certain rules and regulations for the government of his department and the performance of its business, among which rules and regulations are the following, which were in force in October, 1903, and thereafter, being portions of Section 21, Postal Laws and Regulations of 1902, viz.:

> Sec. 21. The Assistant Attorney General is charged with the duty of giving opinions to the Postmaster General, * * * with the hearing and preparation of cases relating to lotteries and the misuse of the mails in furtherance of schemes to defraud the public.
>
> The assistant attorney for the Post Office Department is assigned to the office of the Assistant Attorney General for the performance of such duties as the latter may direct. During the absence of the Assistant Attorney General, the assistant attorney will perform the duties devolving on that officer.

Mr. Lawrence was the assistant attorney for the Postoffice Department, and the oral hearing on October 12, was before him, in the absence of the Assistant Attorney General. All the proofs in the case were subsequently laid before the Assistant Attorney General, and were considered by him, in conjunction with Mr. Lawrence, on the final determination of the matter.

None of the proofs, other than those that are recited in the Assistant Attorney General's memorandum, were submitted by the attorneys to the Postmaster General.

In determining cases of this nature, the Postmaster General does not always limit himself to a consideration of the memorandum submitted to him by the Assistant Attorney General, but frequently inquires further into the facts of the case. Whether or not he did so in this particular instance, and if so, to what extent, is not affirmatively shown.

V.—HISTORY OF THE ADVERTISER.

The master finds that the complainant is not a physician, nor a graduate of any school of medicine, nor is he a pharmacist. He had a common school education in the public schools of New York City. From the age of fifteen until he was twenty-one, he was a clerk in the glass business or wholesale warehouse business; thereafter he successively was a buyer for a St. Louis drug house; manager for Armour & Co., at Kansas City; then associated with his brother in the sale of office furniture at Kansas City; office manager for a firm dealing in physicians' supplies; three or four years in charge of the western department of the Hartman Manufacturing Company, manufacturers of steel picket fences, etc., then sales agent for the same people at Chicago; and finally sales manager for a real estate association at Chicago for a couple of years, during which time he started his robusto business as a side line. Altogether he had spent about three or four years in the drug business prior to starting robusto, and he claims that through opportunities for talking with physicians, and through reading medical books, he had gained information concerning the medicinal effects of his various remedies. He has been conducting his business for the sale of remedies for sexual diseases in men for about ten years. At one time he was interested with his father-in-law, one Dr. Lansdowne, in a drug business at Kansas City. His attention was called by Lansdowne to a system of treatment for sexual weakness used by him and sold in his drug store. It consisted of a combination of remedies composed of a tonic containing phosphorus, nux vomica and damiana, and a laxative. Ganse was arranging to enter into business with Lansdowne for the sale and distribution of said remedy by mail, when the matter was cut short by the death of Lansdowne, which occurred in 1889. It was in 1894 that Ganse commenced the sale of remedies for sexual diseases of men, and he conducted the same as a side line to his regular business until it grew to such proportions as to demand his entire time and attention. The name robusto, as applied to this system of remedies, was adopted by him at the outset in 1894, and has been retained ever since. For many years the system was advertised as adapted to the cure of sexual diseases only, but in February, 1903, the complainant made a change in his system by arranging with one Dr. Krieger to enter into business together for the cure of diseases of every kind, and to conduct a mail and an office practice. New circulars, pamphlets and advertising matter were prepared and were used with reference to the new business, for which the original name of Robusto was retained. This new business continued only about four months, and in June, 1903, the complainant dissolved relations with Krieger, and resumed practically the same business he had been conducting prior to February, 1903. The advertising matter which had been prepared for the new business was discarded, and its further dissemination through the mails was discontinued, and new advertising matter, circulars and pamphlets were prepared and used in the business as thereafter conducted.

Several of the circulars that were distributed during this period of time, from February to June, 1903, were attached as exhibits to the defendant's answer herein, and were introduced in evidence on behalf of the government, both at the hearing before the Postoffice Department and now before the master. There does not, however, appear to be any material difference in the statements contained in such former circulars bearing on the efficacy of complainant's remedies in the cure of sexual diseases, and the statements contained in the advertising matter that was substituted therefor and used thereafter, and the master does not find that the introduction of such earlier circulars before the Postoffice Department worked any prejudice against the complainant in the determination of said case.

V-A.—ANALYSES OF THE REMEDIES.

The master finds that the remedies that were used by the complainant for the cure of sexual diseases were certain tablets and pills, referred to as the red tablets, the white tablets, the red ellipsoid pills and the white round pills.

There were in evidence before the master four different statements of the composition of these remedies, to-wit: the analysis by the government's chemist, the formulas furnished by Ganse to McAfee, the formulas furnished by Sharp & Dohme, manufacturing chemists, who supplied said remedies to Ganse, and the analysis of the complainant's witness, Gudeman, which concurs qualitatively with the Sharp & Dohme formulas. All the others differ from each other.

The master finds that the formulas furnished by Ganse to McAfee were not correct, and did not truly show the composition of the remedies used by him; that the analysis by the government chemist of the pills and tablets examined by him was correct, and that said pills and tablets did not contain nux vomica in appreciable quantities, but did contain Spanish flies; and that the analysis by the complainant's chemist correctly showed qualitatively the constituents of the pills and tablets examined by him.

No satisfactory explanation is furnished of the difference shown by the analysis of the two chemists. It was suggested by counsel for Ganse that owing to the smaller quantity of material examined by the government chemist and the consequent greater difficulty in detecting nux vomica therein, the analyst may have failed to find it, and yet it may have been present. This explanation the master does not consider probable, in view of the great experience and skill of the government chemist, and the fact that he made careful search in testing for nux vomica, and failed to find it.

It, however, becomes unnecessary to reconcile the two analyses, in view of the master's conclusion hereinafter stated, that none of the several combinations of remedies shown could effect the cures advertised by the complainant in his literature.

VI.—COMPOSITION OF THE REMEDIES.

According to the formulas submitted by Sharp & Dohme, who are well-known, reputable chemists, the red tablets and the white tablets were of the same composition, and differed only in color. The formula by which they were compounded was No. 4,834, and called for a powdered extract of nux vomica, zinc phosphid, cantharides and damiana; the red ellipsoid pill was compounded according to formula No. 8,123, which called for Blaud's mass and extract of nux vomica; and the white round pill was compounded according to formula No. 3,892, which called for aloes, extract of podophyllin, nux vomica, belladonna leaves, capsicum, croton oil and aloes. Formula No. 4,384 is a good general and nerve tonic; No. 8,123 is also a good general tonic; formula No. 3,892 is a mild laxative.

VII.—METHOD OF ADVERTISEMENT AND SALE.

The master further finds that at the time of the issuance of the fraud order in this case, the complainant, in the regular course of his business, was making extensive use of the Post-office establishment of the United States and of the United States mails, in distributing his circulars and advertising matter and in sending his remedies to patrons and collecting payment therefor; and that during the year preceding the 2nd of June, 1904, he had furnished his remedies, through the United States mails, to between 25,000 and 30,000 patrons. His method of carrying on said business was as follows:

He had purchased or rented lists of names and addresses or persons from certain letter brokers, who made it a business to collect letters written in response to newspaper advertisements. The lists thus procured by Ganse were of letters written in response to advertisements of remedies for nervous debility, and he had in this manner procured lists containing upward of 15,000 names and addresses. To the persons whose names appeared on these lists, he mailed a reply post-card. This post-card (government's exhibit 78) was signed "T. G. Ganse," and contained among other statements, the following:

Having satisfied ourselves by the most thorough tests that we have a PRACTICAL SYSTEM for *the quick and lasting cure of sexual and nervous diseases*, we are going to GIVE AWAY 5,000 COURSES and let them speak for themselves by *actual results*. We find that if we can cure one person in a community, it is an easy matter to reach others. This new system goes *right to the weak spot*, and we ask the opportunity to demonstrate that it will quickly revive new vigor.

This new, vitalizing system has just been perfected and you can not realize how far it is ahead of the old fogy poisons, the played out Electric Belts, the C. O. D. and other frauds until you try it. * * * This New System will CURE TO STAY CURED all forms of Sexual and Nervous Debility, with their distressing complications, Spermatorrhea, Varicocele, Atrophy and all associated diseases that result in loss of sexual vigor. Young, Middle Aged and Old will find it truly "A MAN BUILDER."

The return half of the post-card is addressed to Ganse, and contains a blank form, to be filled out with the acceptance of the offer. The card is headed: "A Course Free," and states: "To introduce our system we will send a course free of charge to one person in each locality," and such cards were sent not merely to one person, but to as many persons in any locality as Ganse had addresses of.

On receipt of the return part of the postal card a so-called six days' supply, consisting of twelve pills each of the red ellipsoid pill and the white round pill, was mailed to the address given. A circular giving directions for use was mailed with these remedies, which circular also contained the following matter, headed "Important."

Bear in mind that ROBUSTO is a fixed system of formulas which act on an entirely new, progressive principle. This process is in the hands of the most skillful chemists of the land, and the plan of carrying out the system which eventually includes an internal and external combination, *increasing in power as it progresses*, is not deviated from. * * * WE KNOW that the ROBUSTO Strength Building Method, as now established, will cure one thousand infirmities while others will be patching up a hundred.

Two days after sending this test course, a circular letter (exhibit 47), together with a booklet (exhibit 48), was mailed to each party to whom the test course had been sent. The letter contained an offer to send a full course of treatment for the sum of four dollars, and in case such course should not be sufficient to effect a cure, another course would be mailed free of charge. Both letter and booklet contained many statements regarding the complainant's system of remedies and the curative effect of robusto on different sexual diseases, some of which statements are recited in the Assistant Attorney General's memorandum hereinbefore quoted.

If no reply was received to this communication, the complainant then mailed another letter to each of said parties, offering easier terms for the purchase of his remedies, and with this letter, a printed circular, entitled or bearing the heading "Robusto, a Man Builder." (Government's exhibit 51.) The quotations from the complainant's literature that are recited in the memorandum from the Assistant Attorney General to the Postmaster General, are all found in these three exhibits, Nos. 48, 49 and 51, and therefore they will not be here repeated.

If still no reply was received, the complainant then sent a circular making still easier terms in the way of payment for his medicines, and accompanied this circular with a booklet, entitled "Robusto, a Man Builder, a Bracer and Developer," which reiterates many of the statements contained in Exhibit 48, already referred to, and also stated, as follows:

This advanced "Strength-Building" method is acknowledged now by the highest authorities to be the most effectual in cases of weakness, anemia, etc., but more particularly in the various forms of SEXUAL WEAKNESS, for which we believe it is the only reliable specific.

If you have that worn out feeling, ROBUSTO will cure it, as it will torpid liver, imperfect circulation, stomach weakness, headache, sleeplessness, lack of energy of either body or brain. If you are thin or wasted, it will give you weight and strength. It will develop and equalize all the forces which nature has stowed within your body, with the result that within a short time it will fit you for more real happiness and satisfaction with yourself than you now dare to hope for.

When orders for the full course came in reply to these communications, a so-called fifteen days course was mailed to the patron, consisting of 15 red and 15 white tablets and 30 of the white round pills. With this fifteen days' supply was sent an order entitling the customer on signing and returning the same, to another fifteen days' course without charge. The second fifteen days' course was usually regularly sent, whether it was ordered or not.

Thereafter, complainant's method was to quote prices for treatment by the month for his robusto remedies, and to mail circulars containing various so-called confidential offers and promises and reduced prices, seeking to induce a continuance of patronage.

VIII.—FALSE STATEMENTS.

The master finds that many of the statements made by the complainant and contained in the circulars, letters, and other advertising matter circulated by him through the United States mails, were materially and substantially false and misleading in material matters of fact, and that the necessary and inevitable result and effect of such false and misleading statements were to cheat and defraud those into whose possession such advertising matter came, and who dealt with the complainant under the faith and hopes inspired thereby.

IX.—FALSE CLAIMS OF NOVELTY.

All the combinations of remedies shown by the Sharp & Dohme formulas and the chemical analysis, and all the drugs entering into them, are old and well-known remedies, and have been used generally among the medical fraternity in the same or similar combinations for very many years, and the formulas are standard formulas and are found in the advertising lists of the regular supply houses engaged in the furnishing of physicians' supplies.

It is claimed by the complainant that although the remedies used by him may not be novel, yet the method of administration, constituting what he calls his progressive plan, commencing with small doses and increasing as the system progresses, with added ingredients and greater strength and power, is new and different from anything ever before heard of, and warrants the claims made by him in that regard.

The master finds that the so-called progressive plan existed only in the complainant's literature and advertising matter, and was not found to any extent in his actual practice. The only internal medicines used by him in the treatment of sexual weaknesses and diseases of the sexual system were the red and white tablets, the red ellipsoid pills and the white round pills. He did not use any remedies or combinations of remedies with added ingredients and of increasing strength as the treatment progressed. It is true that he professed to have certain other remedies for certain specific diseases, such as catarrh, rheumatism and dyspepsia, and in the treatment of varicocele, he claimed to use an external ointment or varicocele absorbent, the composition and effect of which have not been shown; but in the treatment of sexual diseases generally under the robusto system the only internal remedies used by him were as above stated.

All of the pills and tablets were procured from Sharp & Dohme, and he obtained his remedies from no other source. The statement of his account with Sharp and Dohme (government's exhibit 201), covering all purchases made by him for upward of two years, shows that during the year prior to the issuance of the fraud order, practically the only remedies purchased by him were the red and white tablets and the red and white pills, and of those his purchases amounted to many hundreds of thousands.

The master, therefore, finds that the progressive plan feature of the complainant's method of treatment existed only in his advertising literature, and not in actual practice, and that neither in the remedies used nor in the course of treatment adopted by the complainant was there anything novel or peculiar.

X.—REAL STATUS OF REMEDIES.

The remedies that were sent by the complainant through the mails, whether their ingredients were as shown by the government's chemist's analysis or as shown by the Sharp & Dohme formulas, did not and could not cure all forms of sexual and nervous debility with their distressing complications; said remedies did not and could not effect a quick and lasting cure of sexual and nervous diseases; they did not and could not cure spermatorrhea, nor varicocele, nor hydrocele, nor stricture, nor prostatic irritation, nor constipation, nor liver disease; they did not and could not reduce fatty tissue; said remedies had no power to eliminate diseased tissue, nor to develop and restore shrunken and atrophied sexual organs to their normal proportions and strength; said remedies are not a specific in the various forms of sexual weakness; in cases of constipation the effect of their temporary use would be simply to cause a looseness and movement of the bowels, but their continued use would have the effect to aggravate the constipated condition of the patient and make it permanent; several of the above-mentioned diseases, such as stricture, varicocele and hydrocele, can not be cured by the use of any internal remedies, but are capable of being cured, if at all, only by a surgical operation.

XI.—REMEDIES HAVE SOME BENEFIT.

The complainant's system of remedies hereinbefore described consisted of certain tonics that are well known as general and nerve tonics, and of other drugs well known for their effects as laxatives, or in large doses, as cathartics. It is unquestioned that the tonic remedies have a medicinal effect and are frequently useful in the proper treatment of many diseases, including certain of the diseases claimed to be cured by the complainant; such use is as aids or adjuvants to the specific treatment, owing to their tonic effects on the general nervous system, and especially because of the generally debilitated condition of the patient's system, which is frequently coincident with the specific disease.

So, too, in cases complicated with constipation, it is frequently helpful that the bowels should be kept open and free from accumulated matter, for which purpose the use of a mild laxative is proper treatment. These uses of remedies similar to the tonics and laxatives employed by the complainant are approved generally by physicians and are recommended by standard medical writers on the treatment of disease.

XII.—UNWARRANTED CLAIMS.

The master finds that the fact that such remedies have such medicinal effects, and are used as aids in the proper treatment of disease for the purposes stated above, furnishes no warrant for the extravagantly false and misleading statements of the complainant relative to the positive cures effected by his remedies on the various diseases above mentioned.

This new system will cure to stay cured all forms of sexual and nervous debility, with their distressing complications, spermatorrhea, varicocele and atrophy.

It will develop wasted, atrophied parts to normal proportions and strength.

It is the grandest remedial plan ever devised for the relief of sexual debility.

It consists of the most potent remedies known to science.

It will eliminate the diseased tissues in varicocele or stricture or prostatic inflammation.

In the various forms of sexual weakness it is the only reliable specific.

These and also many others that might be quoted, find in the proofs no basis of fact to sustain them, and rest on no substantial results of experience.

XIII.—NATURE OF THE FRAUD.

Many of the above and similar averments are statements of absolute matters of fact.

As to such as may be claimed to be matters of opinion, the master finds that they were made by one who had or professed to have, or is presumed to have had, superior sources of information and especial knowledge on which to base his opinion, and the statements were furthermore made with reference to the curative powers of certain compounds, the actual composition and ingredients of which were concealed and not disclosed. These statements were widely circulated for the purpose of influencing those to become complainant's patrons who were without such special means of information, and who relied and had a right to rely on complainant's superior knowledge, information and judgment.

If, under such circumstances, opinions not honestly entertained, are expressed concerning the quality, merits and curative effect of the medicines which are sought to be marketed, with the intent of influencing prospective purchasers, such opinions may justly be regarded as false and fraudulent misrepresentations within the meaning of the Federal Statutes respecting the fraudulent use of the mails.

XIV.—ADVERTISER KNEW HE WAS DECEIVING.

The master finds that the complainant was acquainted with the properties and curative effects of the remedies advertised and sold by him; that he had read various standard authors on the treatment of sexual diseases, and understood the proper use and limitations of said remedies; that he know that the only possible beneficial effect that they could have on the human system would be due to their tonic or laxative properties; he knew that his medicines were incapable of producing

the effects on disease that are claimed in circulars and advertising matter; and particularly he knew that certain of the diseases advertised by him to be permanently cured by his remedies, are capable of cure, if at all, only by a surgical operation, under the care of a competent physician, and could not be cured by any medicines known to science. He also knew that the remedies used by him were not new remedies, nor were the combinations thereof new, but that both the remedies and the combinations were old and well known and had been in common use among physicians and in the medical world for very many years. He also knew that the alleged novel features of his robusto system, consisting of the so-called progressive, strength-building plan, with added remedies of increasing power, had no existence in fact.

In claiming for his remedies curative qualities and powers which he knew they did not possess, he fraudulently and wilfully intended to mislead and deceive and impose on the public, and by inducing prospective patrons under the guise and influence of false hopes of being cured of their diseases to become purchasers of his compounds, he schemed to obtain, and did obtain from them, large sums of money by means of false and fraudulent representations.

XV.—INDISCRIMINATE SALE.

The master finds that in the sale and distribution of his medicines, the complainant made no inquiry into the specific character of the disease in any individual case, and failed to examine into the symptoms or causes of the maladies with which those with whom he was dealing were afflicted or believed themselves to be afflicted; but he supplied the same remedies and prescribed the same mode of treatment indiscriminately and to all alike, and to all alike gave the same unbounded assurances of positive cure, with no knowledge before him of their physical condition or the nature of their diseases or supposed maladies further than the mere fact that they had at some time responded to a newspaper advertisement for a cure for nervous debility.

XVI.—NO QUESTION OF FAITH HEALING INVOLVED.

The master finds that the complainant did not pretend or attempt to lead his patrons to believe that his method of cure of disease was based on faith, or on anything in the nature of Christian Science, or that it was in any respect founded on the theory that the mind of the patient is a perceptible factor in the treating, curing, benefiting and remedying of disease; but his representations were wholly regarding the efficacy of certain medicines which he declared to be specific cures for the diseases specified.

CONCLUSIONS OF LAW.

As applicable to the foregoing facts, the master finds the following conclusions of law:

1. The complainant does not come into this court with clean hands, but the evidence shows that he is engaged in conducting a scheme or device for obtaining money through the mails by false and fraudulent pretenses, representations and promises, and, therefore, a court of equity will not lend its aid in furtherance of such scheme.

2. While a reasonable degree of exaggeration is justifiable in advertising and extolling the virtues or qualities of that which one is endeavoring to sell, and some degree of commendation and praise of his goods is permissible to a vendor, yet the latitude ordinarily allowed him to puff his wares would not at all justify the extravagant representations and false statements contained in the advertising matter distributed by the complainant.

3. There was presented to the Postmaster General and personally considered by him certain evidence strongly tending to support the finding of the fraud order. Such evidence consisted of the recitals contained in the memorandum and recommendation that was submitted to him by the Assistant Attorney General, and was competent evidence to be considered by the Postmaster General in determining the question of the issuance of such order.

The fact that all of the evidence considered by the Assistant Attorney General may not have been presented to the Postmaster General and been personally considered by him, will not, under the circumstances of the case, affect the legality of his action in issuing the fraud order. To have such effect, it must at least be shown that by reason of certain evidence not having been presented to and considered by the Postmaster General, he has based a fraud order on a palpable mistake of the controlling and material facts. No such proof has been made in this case.

4. When a fraud order has been signed and issued by the Postmaster General, reciting that the facts therein found are based on the evidence satisfactory to him, it partakes of the nature of a final decision by a tribunal duly established by law for the determination *pro hoc vice* of the facts found. It will be presumed in aid of such order and its validity, that the finding was based on satisfactory evidence, and this presumption will prevail unless the contrary is made satisfactory to appear.

Under the circumstances of this case, such presumption will not be rebutted by proof that the Assistant Attorney General did not submit to the Postmaster General certain of the evidence that was heard by him. It was frequently the practice of the Postmaster General, in cases of this nature, not to limit his investigation to a consideration of the memorandum submitted by the Assistant Attorney General, but to personally make further inquiry into the facts, and in the absence of countervailing proofs, it will be presumed in aid of the validity of the fraud order, that such further inquiry was made by him in the case at bar.

5. The fact that no opportunity was given the complainant, prior to the issuance of the fraud order, to contest the accuracy of the government's chemist's analysis, and to prove complainant's contention that his remedies did contain the drugs set out in complainant's formulas, to be true, would not affect the legality of the Assistant Attorney General's action in recommending the fraud order, nor the action of the Postmaster General in issuing the same, nor furnish any cause for holding the fraud order invalid.

Assuming it to be true that the remedies used by the complainant were compounded of nux vomica, Blaud's mass, and the other constituents shown by his formulas, such medicines are shown to be wholly incapable of effecting the cures or working the results on sexually debilitated patients that are set out and promised in the complainant's advertising matter. It is, therefore, immaterial whether the actual composition of complainant's remedies was as shown by the government's chemist's analysis, or by his own formulas, because neither compound could have the effect of producing the cures advertised by him.

6. The master finds that by Section 1, of Chapter 1, of the United States Revised Statutes it is provided that the reference in said statutes to any officer shall include any person authorized by law to perform the duties of such office, unless the context shows that such words were intended to be used in a more limited sense. By section 161 of said Revised Statutes the Postmaster General is authorized to prescribe regulations not inconsistent with law for the government of his department, the distribution and performance of its business, etc. The postal rules and regulations cited in the earlier part of this report are in due compliance with the foregoing statute, and have the force and effect of laws, and the designation by said postal rules and regulations, of the Assistant Attorney General as the officer "charged with the hearing and preparation of cases relating to lotteries and the misuse of the mails in furtherance of schemes to defraud the public," is an authorization *by law* of such officer to perform said duties.

7. The master finds that the context in sections 3929 and 4041 of said revised statutes does not show that the reference therein made to the Postmaster General was intended to be used in a limited sense, or to mean that the hearing of cases under such sections must be had before him personally, or that such hearing could not, under Section 1 of Chapter 1 of said revised statutes, be had before any person authorized by law to perform such duty.

8. The master further finds that under the provisions of the revised statutes aforesaid and under the regulations which have been adopted by the Postmaster General in pursuance of the authority conferred by said statutes, the Assistant Attorney

General, and in his absence the assistant attorney for the Postoffice Department, were duly charged with and authorized by law to discharge the duty of hearing and preparing cases relating to the misuse of the mails in furtherance of schemes to defraud the public; and that the methods pursued by the Postmaster General and by his subordinates in the hearing and determination respecting the issuance of a fraud order in this case, were in conformity with law and in conformity with the rules and regulations of the Postoffice Department.

The master is of the opinion that the fraud order issued against the complainant by the Postmaster General, was, under the facts and circumstances as disclosed by the proofs herein, lawful, and was authorized by Sections 3929 and 4041 of the Revised Statutes of the United States.

10. The master finds that the hearing and determination of the question as to whether or not the complainant has been guilty of a scheme to obtain money through the mails by means of false and fraudulent misrepresentations has been lodged with the Postmaster General and his subordinate officers charged by law with such duty. The jurisdiction thus vested is exclusive, and no court is empowered to review the proceedings in such cases held in conformity with the law, where the finding is based on evidence tending to sustain it, and the proceedings are not tainted with fraud. It follows, therefore, that the finding of the Postmaster General in this case is one which this court has no power to revise or over-rule, and that his action in directing the issuance of the fraud order is final.

It is, therefore, respectfully recommended that the complainant's motion for a temporary injunction herein be overruled; that his prayer for a permanent injunction be denied, and that the bill of complaint be dismissed at the complainant's costs.

All of which is respectfully submitted.

HERVEY W. BOOTH.
Special Master in Chancery of the Circuit Court of the United States for the Northern District of Illinois.

Therapeutics

[It is the aim of this department to aid the general practitioner by giving practical prescriptions and, in brief, methods of treatment for the diseases seen especially in every-day practice. Proper inquiries concerning general formulae and outlines of treatment are answered in these columns.]

Treatment of Wounds.

Dr. Burger, in an abstract in *Med. Fortnightly*, recommends, in the treatment of wounds such as usually occur in factories, that the wound be cleansed with a sublimate solution, after which pure balsam of Peru be dropped over the affected areas and gauze immersed in the balsam applied. The gauze does not adhere to the wound as occurs in dry dressings, nor does it macerate the tissues as do moist dressings. The dressings should be changed every two or three days. In this way the wounds heal quickly and are easily kept clean. Varicose ulcers may be treated in the same way with fairly good results.

Varicose Ulcers.

The following ointment is recommended by Petretto in treatment of varicose ulcers:

℞ Argenti nitratis.....gr. v | 30
Balsam Peru .....ʒiss | 6
Ung. simplicis .....ʒiii | 90

M. Sig.: Apply locally to the affected areas after thoroughly cleansing the parts.

By this method the ulcers become clean, the secretion and odor are diminished and healing takes place rapidly.

Coryza.

The following combinations are recommended by *Med. Press* in the treatment of acute coryza:

℞ Acidi borici .....ʒi | 4
Menthol .....gr. x | 65
Cocainæ hydrochlor.....gr. v | 30
Pulv. talci .....ʒii | 8

M. Sig.: To be insufflated into the nose. Or:

℞ Sodii iodidi .....ʒi | 4
Syr. aurantii.
Syr. limonis, āā.....ʒi | 30
Aquæ .....ʒv | 180

M. Sig.: One tablespoonful three times a day in milk.

As an alkaline wash the following is recommended by some authors:

℞ Acidi carbol.....gr. xv | 1
Sodii boratis.....ʒi | 4
Glycerini .....ʒii | 8
Aquæ destil q. s. ad.....ʒvi | 180

M. Sig.: To be used as an alkaline wash by spraying into the nares three times a day.

This should be followed with an oil spray as follows:

℞ Thymol .....gr. 1/4 | 015
Olei caryophylli.....m. iii | 20
Liq. petrolati .....ʒi | 30

M. Sig.: To be used as a spray in the nose.

Internally the following is valuable in relieving the acute congestion:

℞ Camphoræ .....gr. xv | 1
Quin. hydrochlor.....gr. xlv | 3
Tinct. aconiti
Tinct. belladonnæ, āā.....gr. xl | 2 | 65
Saccharī lactis q. s.

M. Ft. cap. No. xv. Sig.: One capsule every two or three hours.

In some cases the following may be prescribed:

℞ Morphinæ sulph.....gr. 1/12 | 005
Atropinæ .....gr. 1/300-1/600 | 0002-.0001
Caffeinæ .....gr. 1/4 | 015

M. Ft. capsula No. i. Sig.: One such capsule three or four times daily.

The following combinations have also been recommended in the form of insufflations:

℞ Aluminis pulv.....ʒss | 2
Sodii boratis.....ʒss | 2
Menthol .....gr. 1/3 | 02
Zinci tannatis.
Bismuthi tannatis, āā.....gr. xlv | 3
Lycopodii .....ʒii | 8

M. Ft. pulvis. Sig.: As an insufflation. Or:

℞ Zinci salicylatis.
Bismuthi tannatis, āā.....ʒi | 4
Sodii boratis .....ʒss | 2
Salol .....gr. xx | 1 | 30
Magnes. carb.....ʒii | 8

M. F. chartula. Sig.: As an insufflation.

In chronic rhinitis the following may be used:

℞ Cocainæ hydrochlor.....gr. ii | 12
Camphoræ.
Aluminis, āā.....gr. iss | 09
Menthol .....gr. 3/4 | 05
Saccharī q. s.

M. Ft. pulvis. Sig.: As an insufflation into the nares twice daily.

Syphilis.

The treatment of syphilis should be commenced just as soon as the diagnosis is made, according to Hackett and Aronstam in *Med. Age.* The initial sore requires only cleanliness and the application of an innocuous antiseptic powder such as bismuth subnitrate or boric acid alone, or in combination.

Cauterization is contraindicated and should be resorted to only when the initial lesion is complicated by chancroidal infection and threatens to become phagedenic. The system should be gotten under the influence of mercury without delay, and mercury should be taken regularly for twenty months with periods of short intermission. The authors recommend what they call the "cyclic method," consisting in the administration of mercury in variable, changeable and alternate forms, and in the intervals giving tonics and eliminants.

METALLIC MERCURY.

This should be given the preference in the early part of the treatment, administered combined as follows:

℞. Hydrarg. cum cretæ.....gr. xxiv 1|65
Ext. nucis vomicæ.....gr. iii |20
Ext. hyoscyami .....gr. iv |25
Ferri lactatis .....gr. xv 1|

M. Ft. capsulæ No. xii. Sig.: One capsule three times a day, two hours after meals.

The foregoing should be continued for seven days, after which a bitter tonic in combination with belladonna and arsenic should be administered as follows:

℞. Tinct. nucis vomicæ.....3i 4|
Tinct. quassiæ .....3iii 12|
Tinct. belladonnæ
Liq. potassii arsenitis, āā.....3i 4
Essentiæ pepsini q. s. ad.....℥iv 120|

M. Sig.: One dessertspoonful before meals, in water.

This should be continued for three days.

PROTOIODID OF MERCURY.

The protoiodid of mercury is the form next to be employed, given in doses of grain ⅛ to ¼ (.008-.015) and administered alone or in combination with the tartrate of iron and ammonium. This should be continued for one week, followed by the same tonic mentioned above for three days. This constitutes a second period.

INUNCTIONS.

Inunctions of mercury may be employed next, first washing that portion of the skin to be anointed with a saline solution, followed by a brisk alcohol rub, after which the mercurial ointment is applied with thorough friction. The most appropriate time is an hour before retiring. This must be repeated for twelve consecutive nights, applying it: 1, On right arm and corresponding axillary space; 2, on left arm and corresponding axillary space; 3, on anterior thoracic region; 4, on the abdomen; 5, on the right thigh and inguinal region; 6, on the left thigh and inguinal region; 7, on the right leg; 8, on the left leg; 9, on both hands; 10, on both feet; 11, on the lumbar and sacral region; 12, on the dorsal and cervical areas. Two grains (gr. 60) of the ointment are used for each inunction. On the completion of the twelve applications a warm alkaline bath is taken and three days of repose, during which time the tonic is taken.

MERCURIC IODID.

The mercuric iodid is then given in doses of grain 1/12 to 1/8 (.005-.008) three times a day, in the same manner as the protoiodid, followed by a period of remission.

MIXED TREATMENT.

The "mixed treatment," which consists of the simultaneous use of mercury and iodin, the former as the bichlorid or biniodid and the later in the form of the sodium or potassium salt, is as follows:

℞. Hydrarg. biniodid .....gr. ii |12
Sodii iodid .....3iiiss 14|

M. Ft. cap. No. xxi. Sig.: One capsule two hours after meals. Or:

℞. Hydrarg. biniodidi.....gr. i |06
Potassi iodidi .....3ii 8|
Tinct. gentianæ co.....3iii 12|
Syr. trifolii co. q. s. ad.....℥ii 60|

M. Ft. solutio. Sig.: One teaspoonful, with water, two hours after meals.

If anemia be present the following combination is advised by the authors:

℞. Acidi arsenosi .....gr. 1/5 |012
Sodii iodidi .....3iss 6|
Hydrarg. biniodidi .....gr. ss |03
Ferri lactatis .....gr. xxiv 1|65
Quin. sulph.....gr. vi |40

M. Ft. capsulæ No. xii. Sig.: One capsule two hours after meals.

This mixed treatment should also be continued for the same length of time as the other preparations.

The use of mineral acids must be avoided, but the fruit acids are permissible.

Pork and pastry must be excluded, also alcohol, coffee and tea; smoking must be abstained from.

ELIMINATIVE TREATMENT.

The patient is next put on ascending doses of sodium or potassium iodid for one week, beginning with one minim of a saturated solution, gradually increased. If the iodids are not well borne the syrup of hydriodic acid may be substituted or the iodids may be given per rectum, and a few drops of the tincture of opium may be added to allay rectal tenesmus. After a period of repose for three days, with the tonic treatment administered, warm alkaline baths should be given daily for one week. All treatment is suspended then for a longer interval, perhaps two weeks, at the end of which time the above method should be resumed. The above outline of treatment, according to the writers, possess the following advantages:

1. It never salivates the individual.
2. No untoward after-effects are discernible.
3. Gastrointestinal disturbances are avoided.
4. Consecutive mercurial dermatoses are not apt to appear.
5. It possesses greater efficacy, promptness and permanency.
6. It is more systematic and thorough.
7. The tertiary phenomena are held in abeyance.

Capillary Bronchitis in Children.

Heubner recommends in the treatment of capillary bronchitis in children counter-irritation by mustard to combat the suffocative conditions. He advises half a kilogram of fresh mustard flour stirred into two liters of warm water until the fumes arising from the mixture irritates the conjunctivæ. A sheet is wrung out of the solution and spread on a blanket. The child is then wrapped in this sheet from head to neck and the blanket drawn over the sheet, giving the patient a mustard pack in which he remains for ten minutes or until the skin is irritated and reddened. The child is then removed from the pack and bathed in warm water and placed in an ordinary warm pack for one or two hours, depending on the reduction of the temperature. If the temperature should increase, or the perspiration become too profuse, he should be taken out before the time stated, again bathed in warm water, dried and clothed in a gown and placed in bed. This treatment may be repeated in twenty-four hours if necessary.

Administration of Water Before Giving Chloroform.

In order to prevent vomiting after administering chloroform, Prof. Denuce, in *Med. Rev. of Reviews*, states that water should be given before the anesthetic as deglutition takes place during the anesthesia and the air charged with chloroform is swallowed. The chloroform irritates the mucous membrane of the stomach, which, according to the usual practice, is empty and thus causes vomiting. According to the author's idea, the water prevents the chloroform from coming in contact with the mucous membrane, as the most troublesome vomiting may occur on an empty stomach, and the vomiting of a small quantity of water would not be attended with danger. It must not be forgotten that the water passes quickly from the stomach. The writer uses the following method in the administration of the water: An hour and a half before the operation he gives the patient a large glass of water, and this amount is repeated every half-hour until the time for the operation, the patient taking in all four glasses. He relates that in many instances the operations were long, including laparotomies and in none did vomiting occur.

Medicolegal

Communications to Physicians—Refusal to Waive Privilege.—The Kansas City Court of Appeals says, in the personal injury case of Arnold vs. City of Maryville, that it is but repeating the statute itself to say that all information obtained by a physician, whether by communication from the patient or observation of the physician, "which information is necessary to enable him to prescribe for such patient as a physician, or to do any act for him as a surgeon," is privileged, and can not be used against the patient without his

consent. Therefore, though a physician called to attend a plaintiff personally may learn all about the nature of his injuries, or the disease said to have followed therefrom, and no one else may know so well as he, yet the plaintiff need not call him as a witness, and, if he does not do so, no unfavorable inference should be drawn therefrom. It is not even permissible to ask of the party whether he will waive the privilege and permit the physician to testify, since his refusal would tend to discredit him, and thereby in a manner force him to consent. It must be clear that if an unfavorable presumption against one should be allowed when he refused to waive his privilege, or failed to call the physician as a witness, the privilege itself would be destroyed and the policy of the statute thwarted. The first object of the statute may be said to be a humane object; that is to say, to render as much aid as possible to the restoration of the patient's health or relief from his suffering and injury. It, therefore, adopted the policy of rendering every assistance to the physician by holding inviolate any communication made to him in his professional capacity and any information he might receive from an examination of his patient which was necessary to enable him to prescribe; thus encouraging and inducing the patient to offer every aid in his power toward imparting the information. It is apparent that the information gathered by the physician or surgeon must be in his capacity of waiting on the patient with a view to his cure or relief, if possible; that is to say (in the words of the statute), to enable him to prescribe for the patient as a physician, or do any act for him as a surgeon. So, therefore, if a physician or surgeon examines a sick or injured person, not with a view of prescribing for him or doing any act for him in the line of surgery, he is not disqualified as a witness. It was no part of the object of the statute to facilitate the efforts of a litigant in obtaining evidence with which to advance his cause. The court, therefore, holds that, if it appears that physicians or surgeons were called to examine the plaintiff only with a view of qualifying them to testify in the cause, the result of their examination was not privileged.

Friendly Visit Does Not Establish Professional Relation—No Moral Insanity.—The Supreme Court of Louisiana holds, in the case of State vs. Lyons, that it does not follow, because a physician visits a person with whom he is acquainted, and who, being charged with murder, is lying in a hospital, under treatment for a wound, that such visit is paid in a professional capacity, or that the relation of physician and patient is thereby established between them. It also holds that the doctrine of moral insanity, which consists of irresistible impulse coexistent with mental sanity, has no support either in psychology or law.

Admissibility in Evidence of Exclamations of Pain.—The Supreme Court of South Dakota says, in the personal injury case of Klingaman vs. Fish & Hunter Co., that the rule admitting evidence as to complaints or exclamations of pain or suffering is clearly an exception to the general rule that self-serving declarations of a party are inadmissible, but such evidence seems to be admissible under the great weight of authority. However, the rule should not be extended so as to include a narration or statement as to the condition or extent of the injury, and not in their nature exclamatory or expressive of present suffering. Witnesses are not permitted to testify to complaints or statements of physical condition or feeling made by an injured person which are made in answer to a question or interrogation descriptive or narrative in their nature, and which are not a part of the res gestæ (essential circumstances of the case).

Drugless Healing Is Practice of Medicine.

The Supreme Court of New Mexico says that in the case of Territory vs. Newman, where the defendant was indicted for practicing, or offering to practice, medicine without having obtained a license, the jury were instructed as follows: "'The practice of medicine' . . . means (1) to open an office for the practice of medicine; or (2) to announce to the public or to any individual, in any way, a desire or willingness or readiness to treat the sick or afflicted, or investigate or diagnose, or offer to investigate or diagnose, any physical or medical ailments or disease of any person; or (3) to suggest, recommend, prescribe, or direct for the use of any person any drug, medicine, appliance, or other agency, whether material or not material, for the use, relief, or palliation of any ailment or disease of the mind or body, or the cure or relief of any wound, fracture, or bodily injury or deformity, after having received or with the intent to receive therefor, either directly or indirectly, any bonus, gift, or compensation." This instruction, which was objected to, seems to the court to have been favorable to the defendant, rather than otherwise, since it greatly restricted the number of acts which the jury might otherwise have found the defendant committed in violation of the statute. It says that the subdivision complained of was a proper and appropriate one, under the circumstances.

Then the defendant objected that by the statute a new, unusual, and false meaning was given to the phrase "practicing medicine": that he never engaged or offered to engage in the practice of medicine; that, on the contrary, the evidence showed him to be a practitioner of a system of drugless healing; and that the legislature could not so extend the meaning of said words "practice of medicine" as to cover and include methods of healing diametrically opposed to the practice of medicine as theretofore commonly understood and defined. The court answers it would perhaps have been possible for the legislature to choose a better phrase under which to group healing methods of all kinds, although the use of the expression "practicing medicine" to mean the art of healing is by no means new, but rather a return to the original meaning of the word "medical." But whatever may be thought of the terms in which the prohibition of the statute is expressed, there can be no doubt of their meaning; and the defendant was clearly forbidden to do that which the evidence showed, and he did not deny, that he did, without a license from the board of health as provided for by the statute. That it was not claimed he had, and, if the statute was valid, he was liable to the penalty imposed by it.

Again, the court says that it should be noted that the statute does not forbid the use of methods which the defendant said he followed for the cure of disease, or any other methods whatever, but only requires that those who prescribe or make use of them in the practice of medicine, as defined by the statute, shall have qualified themselves for such practice, and received a license, as evidence of such qualification. That the practice of the art of healing, in whatever form and in whatever name it may be followed, is subject to regulation by legislative enactment, under the police power of the state, is so well established that it is no longer open to question. If there were no such rights and regulations, it would be necessary to create them, for the protection of the public against those who take advantage of the widespread ignorance which exists in relation to the human organism to impose their useless and often harmful nostrums and treatments on those who are, or may be led to believe they are, in some way diseased. It is equally certain that the right to regulate should be exercised only in the public interest, and not to create monopolies, or otherwise to violate those fundamental rights which are secured to all citizens.

That certain acts should be made punishable if done for gain, which are not prohibited if done without bad motive, seems to the court to be a matter properly within the discretion of the legislature. It says that it may reasonably have been assumed that the public needed no protection against charitable or friendly ministrations, in which the elements of good faith and sincerity of belief in the remedies prescribed would naturally be present, and in which greed could have no place. It is true that the statute commits the licensing power to a board composed of physicians who shall be graduates of some medical school in good standing, but the inclusion under the term "practice of medicine" of what it is made to cover by the statute might reasonably be construed to extend the meaning of the words used to describe the members of the board in like manner. Whether that view be taken or not, it is certain that the board provided for could be held by the courts to the exercise of its powers in a reasonable and just manner, and

would have no right to refuse to issue a license to any one merely because of his being a practitioner of some school of healing different from that to which the members of the board belong. The defendant claimed, also, that the educational qualifications imposed by the statute were not adapted to or required in the simple method of healing which he followed, and that they amounted to a prohibition of his constitutional right to follow his calling. But the court says that the requirements are the same for all who purpose to engage in the practice of medicine, as defined by the statute in question, and therefore not open to the objection that any particular class is unduly favored.

Current Medical Literature

AMERICAN.

Titles marked with an asterisk (*) are abstracted below.

American Medicine, Philadelphia.

April 15.

1 *Hysterectomy for Fibroids of the Uterus, with a Report of 250 Operations. J. B. Deaver, Philadelphia.
2 Radical Treatment of Gastric Hemorrhage, with a Review of a Personal Case and 99 Collected from the Literature Since 1900. F. G. Connell, Salida, Colo.
3 Paratyphoid Fever, with Report of Six Cases. J. N. Henry, Philadelphia.
4 *Chronic Eczema as a Complication of the Senile Degenerations. M. Leale, New York.
5 *Postpartum Hemorrhage. H. H. Loveland, Syracuse, N. Y.
6 Contribution to Pathology of Sciatica. J. R. Hunt, New York.

1. **Hysterectomy for Uterine Fibroids.**—In discussing this subject Deaver says that fibroids of the uterus do not require removal unless they are productive of symptoms; but when they do become symptom-producing they should be removed promptly before the patient has been weakened by toxemia, hemorrhage or sepsis. Abdominal supravaginal hysterectomy is the operation to be preferred in the majority of cases. Myomectomy is applicable only to younger women in whom the tumors are few in number and subperitoneal in character. Panhysterectomy is to be employed only when intraligamentary growths, whether uterine or ovarian, render the performance of supravaginal amputation difficult or dangerous. Deaver advises that the ovaries or a part of one ovary should be preserved in every woman who has not reached the age of the menopause, unless they are distinctly and indisputably diseased, or unless their retention would needlessly prolong and complicate the operation. The electric treatment of uterine myomas he condemns without reserve. Among 250 operations for uterine fibroids, Deaver has found myomectomy applicable in only 13 instances. Eleven times he enucleated the tumors by the abdominal route, and twice by the vaginal, the growths in the latter instances being large submucous tumors, with no distinct pedicle. In a fourteenth case in which the submucous tumor was pedunculated, he removed the mass by means of the Downes' cautery. All the myomectomy cases recovered and have not had a recurrence of the growths. Among the series of 250 cases, 34 were complicated by gross disease of the adnexa. For this reason, Deaver considers vaginal hysterectomy for fibroids of the uterus distinctly inferior to hysterectomy by the abdominal route. He favors supravaginal amputation because it is attended by a lower mortality rate and is easier of execution in the majority of instances. Panhysterectomies are done only when the myomatous growths extend so far down in the pelvis and are so close to the cervix that it is difficult, if not impossible, to find any suitable line of cleavage for performing a supravaginal amputation. He has employed supravaginal hysterectomy 219 times, with a total of 20 deaths, only 3 of these occurring in the last 105 operations. He never resorts to catheterization of the ureters in either abdominal or vaginal hysterectomy. In 250 abdominal hysterectomies, the ureter was injured but once, when it could not have been avoided, even if there had been a catheter inserted, on account of adhesions.

4. **Chronic Eczema Complicating Senile Degenerations.**—Eczema occurring in old age is attributed by Leale to circulatory changes and their consequent degenerations. Usually it is an eczema erythematosum. These cases often prove very resistant to treatment, yet it is possible to secure a permanent cure in very many of them, and in all cases a great amelioration of the symptoms can be effected if the treatment is persevered in and carried out carefully. Before doing anything at all, it is necessary to determine accurately the condition of the heart and blood vessels, the kidneys, the lungs and the other organs, meeting any pathologic condition by appropriate treatment. The circulation should be properly maintained, and the emunctories carefully watched. Water should be taken frequently, but in small quantities at a time to secure a constant flushing rather than an overdistention of the heart and blood vessels. Local treatment is essential for the purpose of improving the peripheral circulation in the blood vessels as well as in the lymphatics. Carefully regulated and systematic rubbings and frictions best meet these conditions. He adopts a combination of effleurage and massage with friction, the strokes of the hands following as nearly as possible the course of the veins and lymphatics. For lubrication a fine quality of olive oil is used, and with this, for medication, a pure, finely powdered zinc oxid. Each application lasts from twenty to forty minutes, and should be given at night, preferably just before retiring to secure sleep. When more stimulation is required, a strong tincture of pix liquida is used. Every second night, before the application, the patient is given a bath at 94 F., using a pure olive-oil soap. Under this course of treatment one may expect a more or less permanent cure in most cases within from two to eight weeks.

5. **Postpartum Hemorrhage.**—Loveland is of the opinion that postpartum hemorrhage is not always preventable by careful management of the third stage of labor, as some authors seem to believe. The first step in his treatment of a rapid and severe case is the insertion of the hand in the uterus, the other meanwhile manipulating the fundus through the abdominal wall. Of all the intrauterine treatments, except the first mentioned, hot water douching is the most convenient, the most cleanly, and the most effective. The benefit to be gained by packing the uterus with gauze is doubtful; the danger is evident. Later experiences have firmly convinced Loveland that it is not wise to put anything into the uterus that is not necessary, nor to leave anything there that can be avoided, even though impregnated with antiseptics.

Medical Record, New York.

April 15.

7 *Cerebrospinal Meningitis—Epidemic and Sporadic. G. G. Speer, Los Angeles.
8 *Recent Studies in the Diagnosis of Rabies. D. W. Poor, New York.
9 Modern Methods of Treatment in Obstetrics and Gynecology. J. A. Schmitt, New York.
10 Some Points of View in Regard to the Time when to Perform Myringotomy and the Mastoid Operation. E. Amberg, Detroit.
11 *Decapsulation of the Appendix. A. E. Isaacs, New York.
12 *Tuberculous Testicle and the *X*-ray. W. B. DeGarmo, New York.
13 Granulation Wound Adhesions, with a Preliminary Report on a New Application in Preventive Treatment. F. Griffith, New York.

7. **Cerebrospinal Meningitis.**—After presenting a brief historical review of this disease, Speer discusses the clinical history and directs attention to an early pressure symptom which, together with Kernig's sign, he has invariably found present. It consists in a turning in of one or both feet until, if not disturbed, one lies across the other. The legs later become flexed and also tend to cross each other. The plan of treatment is described at length and comprises the use of sedatives, the ice cap, sinapisms to the body, and potassium iodid to promote absorption of the morbid products. Speer prefers the following sedative to opium:

R.	Potassii brom.		
	Chloralis hyd., āā	3ii	8
	Cannabis ind.		
	Hyoscyaminæ, āā	gr. i	.06
	Elix. simplicis q. s. ad	℥i	30

Of this a child of three is given from 10 to 15 drops every twenty minutes until profoundly under its influence, and it must be repeated as soon as there is either moaning or restless movement of the limbs. The dose for an adult is half of one teaspoonful administered in the same manner. All methods of treatment may be made effective and reliable if used with

decision and pushed to the limit of therapeutic effect. Speer says that cerebrospinal meningitis in its worst form is amenable to treatment.

8. **Diagnosis of Rabies.**—The diagnostic value of the so-called Negri bodies or corpuscles, is attested by Poor. He made use of material obtained from 21 dogs, 24 guinea pigs, 10 rabbits, 3 horses and 4 human cases. Of this number, there were 17 cases of rabies occurring naturally. In 16 cases, the disease was produced artificially and 22 animals were used as controls. The Negri bodies are found chiefly as cell inclusions in the Purkinje cells of the cerebellum and in the large ganglion cells in the region of the ammon's horn (hippocampus major). They are minute structures, varying in size from one to 23 microns in diameter, are round or oval in shape; staining reaction eosinophile. In structure they may be homogenous, ring-formed, or vacuolated, and they may contain irregularly grouped granules. A small portion of the brain from both the cortex of the cerebellum and from the ammon's horn is fixed in Zenker's fluid and stained with an eosin-methylene blue combination, in which case the inclusions stand out very clearly as red structures in the blue background of the cell body.

11. **Decapsulation of the Appendix.**—Observing how easily the peritoneal coat could be peeled from the proximal portion of the appendix, Isaacs concluded to utilize the same principle in dealing with the whole appendix when adherent. Having tried this method in a number of instances in which conditions called for it and having found it of decided advantage, it has become an established procedure with him. It saves considerable time and trouble, shortens the operation, and spares considerable handling and manipulation of the viscera. The method is especially useful in those cases of extensive adhesions where but a portion of the appendix can be located, be it either the proximal or the distal portion, and where the rest loses itself in the adhesions and can not easily be traced. The method is as follows: Having located some portion of the appendix, preferably the proximal, the capsule is incised longitudinally, opposite the mesenteric attachment, if possible, so as to avoid the larger blood vessels. The hemorrhage is insignificant. The white glistening surface of the middle layer is the guide to the depth of the incision. The incised serous coat peels off very easily, and the core can be easily separated and raised from its bed without fear of hemorrhage. This white core serves as a guide to the capsule inside of which it can be loosened up a short distance, then the capsule is split for that distance, and the procedure is repeated until the whole length is delivered. A perforated or gangrenous appendix merely makes conditions somewhat more difficult; the decapsulation can be accomplished just the same. As an illustration of the utility of the method, Isaacs gives in detail the history of two cases.

12. **X-Ray for Tuberculous Testicle.**—One case is reported by de Garmo, which was treated with the *x*-ray. There has been no recurrence of the disease after two years. One hundred and twenty-six treatments of ten minutes each were given during a period of ten months. A medium tube was used at a distance of about ten inches.

New York Medical Journal.

April 15.

14 Cases of Enteroptosis and Cardioptosis with Return to the Normal. M. Einhorn, New York.
15 Dietl's Crisis and Some Cases of Movable Kidney. L. W. Atlee, Philadelphia.
16 Inflammation of the Glands of Bartholin. C. C. Miller, Chicago.
17 Atony of the Rectum and Anal Sphincters; Its Etiology, Pathology, Diagnosis and Treatment. (Concluded.) W. Bodenheimer, New Rochelle, N. Y.
18 Erythema and Urticaria, with a Condition Resembling Angio-Neurotic Edema, Caused Only by Exposure of the Sun's Rays. S. B. Ward, Albany.
19 Contribution to the Alcohol Question. S. P. Beebe, New York.
20 Prophylaxis in Pregnancy and Labor. T. A. Rogers, Plattsburgh, New York.
21 Diet in Typhoid. (Concluded.) J. P. Miller, Washington, and G. N. Murphy, Paducah, Ky.

Medical News, New York.

April 15.

22 *Intracranial Traumatic Hemorrhage. J. S. Wight, Brooklyn.
23 *Preliminary Report on the Use of Diphtheria Antitoxin in Epidemic Cerebrospinal Meningitis. F. Huber, New York.
24 Some Points in the Construction of a High-Frequency Machine. C. A. Wright, Leydenstone, Eng.
25 Report on the Use of Stovaine. C. G. Coakley, New York.
26 *Treatment of Chronic Osteomyelitis and of Chronic Bone Cavities by Iodoform Wax Filling. C. A. Elsberg, New York.
27 Significance of Epigastric Pain. A. M. Pond, Webster City, Iowa.
28 *Gastrointestinal Conditions in Epilepsy. J. W. McLaughlin, Galveston.

22. **Intracranial Traumatic Hemorrhage.**—The clinical history of this condition is discussed in detail by Wight, and two cases are reported, one of which terminated fatally.

23. **Diphtheria Antitoxin in Epidemic Cerebrospinal Meningitis.**—Huber makes a preliminary report on the use of diphtheria antitoxin in the treatment of epidemic cerebrospinal meningitis. The antitoxin was injected indirectly into the subarachnoid space. A lumbar puncture was performed, from four to six drams of cerebrospinal fluid were allowed to escape, then from 1,500 to 2,000 units of antitoxin were slowly injected. No ill effects followed in the series of cases in which this was done. In one case an antitoxin rash was observed seven days later. In some of the cases, only one dose was given. In others the injections were repeated two or three times. This treatment should be resorted to early, before anatomic changes have taken place. The malignant type of the disease is not affected by this method. Not only was there observed in most cases an amelioration of the clinical features, but in several cases in which lumbar puncture was repeated within from thirty-six to forty-eight hours, the number of polynuclear cells was less and the diplococci had diminished in number.

26. **Iodoform Wax Filling of Bone Cavities.**—Elsberg reports the results of his experience with the iodoform wax filling of chronic bone cavities proposed by Mosetig-Moorhof (THE JOURNAL, Feb. 18, 1905, p. 583). He has used this material in three cases of chronic osteomyelitis of the hip; four cases of chronic osteomyelitis of the femur; one case of tuberculous disease of the tibia; one of chronic disease of the ulna; and one of chronic tuberculosis of the bones of the elbow-joint. All the patients had been repeatedly operated on according to other methods without permanent cure. Elsberg says that although the results he has obtained with the iodoform wax filling are not so good as those obtained by the author, the improvement in his cases was such as to warrant him in recommending the method for further trial. He thinks it better to remove the Esmarch constrictor before the wax mixture is introduced so that the hemostasis in the bone cavity may be more perfect and the oozing from the bone be perfectly controlled when the normal circulation is established. He has also modified the original technic somewhat. In order to facilitate its hardening, he pours the melted mixture into a basin of sterilized cold water and molds it with the hands until it has about the consistency of putty. He then presses bits of the mass into the walls of the cavity and thus stops the very slightest oozing from the bone and fills up all the small spaces. Then the cavity is tightly packed with a filling in the same way that the dentist fills the cavity in a tooth. He never uses more than 20 per cent. of iodoform in the wax mixture so as to obviate the occurrence of iodoform poisoning, an accident which was observed in one of his cases. In 6 patients, the wounds healed by primary union, except for the drainage opening. In four of these cases, the filling remained *in situ;* in one, a small part of the wax was extruded; in the sixth case all the filling was extruded in the course of two weeks, and the wound then closed rapidly. Success, says Elsberg, will depend to a great extent on the thoroughness with which the operation is done. Reports of his cases will be published in detail later.

28. **Gastrointestinal Conditions in Epilepsy.**—McLaughlin calls attention to the fact that the condition of the gastrointestinal tract in epileptics may have considerable bearing on the production of the seizures. He refers to six cases of genuine idiopathic epilepsy in which the treatment adopted was local, dietetic and general. The results obtained have been uniformly good. The patients are brighter and stronger, and are less nervous and more cheerful. There has been no attack in over two years in one case, and over one year in

another. In other cases the attacks have been milder and less frequent. The local treatment consists of lavage with water containing a teaspoonful of sodium bicarbonate or chlorid to each pint of water, followed in cases of fermentation with solutions of silver nitrate 1 to 4,000, allowing the latter to remain in the stomach five or ten minutes. The faradic current, one electrode intragastrically and the other over the dorsal spine, was also used. The diet must be carefully regulated in accordance with the digestive capacity of the patient. General treatment consisted of the administration of strychnin, quinin, nux vomica, bitter tonics and iron, rhubarb and the preparations of mercury.

Boston Medical and Surgical Journal.

April 13.

29 Cancer in and About the Mouth: Importance of Early Diagnosis. F. C. Cobb, Boston.
30 *Results in Cases of Cancer of the Tonsils, Tongue and Jaws, Operated on at the Massachusetts General Hospital During the Eight Years from Jan. 1, 1892, to Jan. 1, 1900. F. Cobb and C. C. Simmons, Boston.
31 *Results of Treatment of Cancer in and About the Mouth at the Boston City Hospital. H. A. Lothrop and D. D. Scannell, Boston.
32 Use of the *X*-rays in Postoperative Treatment of Cancer of the Mouth. E. A. Codman, Boston.
33 Thermotherapy as a Part of Physical Therapeutics. O. Rozenraad, Berlin.
34 Weather Conditions at the Sharon Sanatorium. W. A. Griffin, Sharon.
35 Suggestion for a Practical Apparatus for Use in Intrathoracic Operations. F. T. Murphy, Boston.

30. **Cancer of the Tonsils, Tongue and Jaws.**—Cobb and Simmons report the results obtained in a series of 92 consecutive cases of cancer involving the mouth, observed at the Massachusetts General Hospital during eight years. There were 71 males and 21 females. Almost all used alcohol and tobacco, and many dated the first symptoms from trouble with the teeth. The average age was 54 1/3 years. Taken by decades, that from 50 to 60 gave the largest number of cases; 60 to 70 years came next, with the decade from 40 to 50 third. The extremes in age were 74 years and 21 years. The operation consisted of everything from a simple curetting, or excision of the tumor, to a complete removal of the tongue, or jaw, with an elaborate dissection of the triangles of the neck. Six patients died soon after operation, giving an operative mortality of 10 per cent. Excluding one case of general purulent peritonitis, which was in no way brought about by the operation, the mortality was 8.5 per cent. One patient died of shock, 1 of delirium tremens and 3 of sepsis. There are 8 cases of cures following operation, and all of these patients are alive and well to-day, the time from the date of operation varying from four to fourteen years. In the ninth case the patient lived four years after operation and returned with a sarcoma. Life in the patients operated on was longer than in those not operated on, 33 of the former living over one year from the first appearance of symptoms to 19 of the latter. The patients living over a year were 23 against 5. In 54 cases of cancer of the tongue, 34 patients were operated on, with an immediate mortality of 8.5 per cent. Four are alive and well to-day; 2 thirteen years after operation, 1 six years after operation and 1 four years after operation. A fifth patient lived four and a half years and then died of sarcoma. The percentage of cures of the original carcinoma is 14.3 per cent. The cures all occurred in old cases, the patients being 70, 74, and two 62 years old. There were 8 cases of cancer involving the tonsils, in only 2 of which an attempt was made to remove the whole growth. All these patients are dead. There were 15 cases of cancer of the upper jaw, in 11 of which operations were performed without mortality. Fourteen of these patients have been followed and all but 2 are dead, the average length of life in the patients operated on being 38.75 months. Two of the 9 patients operated on died within a year, 1 lived three years, 2 lived four and a half years, and 1 is alive and well to-day, eight years after operation. In one case of partial excision the patient is alive and well six years after operation. Of 15 cases of cancer of the lower jaw 12 patients were operated on and all but 2 are dead. This series of cases shows that although in malignant disease around the mouth the prognosis is very grave, a certain per cent. of patients are cured by operation.

31. **Id.**—Lothrop and Scannell base their report on records of the Boston City Hospital during a period of nine years. These records embrace 69 cases, 60 of which have been traced. Carcinoma of the tongue occurred in 30 cases; of the inferior maxilla in 22; of the superior maxilla in 9, and of the tonsil and fauces in 8. Seven cases occurred between the ages of 30 and 40; 17 between 40 and 50; 25 between 50 and 60; 15 between 60 and 70, and 5 between 70 and 80. Fifty-six patients were males and 13 were females. Of the total number of 60 cases which were traced, 17 were either considered inoperable or else the patients refused operation. The average duration of symptoms before application was made for treatment was about seven months. Of the 60 patients traced 56 are dead and 4 are alive, the latter seven, five and one-half, five and two years respectively after operation, the lesions in these cases occurring in the tongue and inferior maxilla (each two). In the patients reported as dead the average duration of life, whether operated on or not, was about nine months, the longest being seven years and the shortest twenty days. The average duration of life from time of first symptom, sixteen months; average duration in those not operated on, six months; average duration in those operated on, nine and one-half months. In cancer of the tongue operated cases lived twice as long as non-operated cases. In cancer of the inferior maxilla operated cases lived four times as long as non-operated. In cancer of the superior maxilla, tonsil and fauces there were not enough patients not operated on to justify a comparison.

St. Louis Medical Review.

April 15.

36 Two Cases of Landry's Paralysis; One Terminating in Recovery, the Other in Death. T. Diller, Pittsburg, and C. L. Billard, Allegheny.
37 Uterine Disease as a Factor in Brain Softening. E. A. Hall, Victoria, B. C.
38 Some Predisposing Causes of Bronchial Diseases Peculiar to Pittsburg and Vicinity. W. T. English, Pittsburg.

Lancet-Clinic, Cincinnati.

April 15.

39 Study of Tuberculosis from a Surgical Standpoint. J. C. Oliver, Cincinnati.
42 Some Dermatologic *X*-ray Abuses. M. L. Heidingsfeld and A. J. Markley, Cincinnati.
43 Splenic Anemia—Banti's Disease (?) Splenic Enlargement for Five Years; Hemorrhages for One Year. J. M. Withrow, Cincinnati.

Journal of the Missouri State Medical Association, St. Louis.

April.

44 Influenza Complicating the Puerperium. W. Hall, St. Louis.
45 Brachial Paralysis Following Surgical Anesthesia: Report of Two Cases. H. S. Crossen.
46 *New Test for Detecting Minute Quantities of Albumin in Urine. A. N. Ravold, St. Louis.
47 Presentation of Specimen of Sarcoma and Patient. J. C. Morfit.
48 Unusual Vitality. F. W. Abeken, St. Louis.
49 Topography of the Vertebral Spines and Lower Ribs, with Reference to the Identification of the Individual Bones. V. P. Blair, St. Louis.
50 Uterine Replacement. D. Forster, St. Louis.
51 Tuberculosis. J. W. Nieweg, Owensville, Mo.
52 Treatment of Certain External Diseases of the Eye by *X*-rays. J. Green, Jr., St. Louis.

46. **New Albumin Test.**—Ravold describes his method of detecting very minute quantities of albumin in the urine by increasing the specific gravity of the solution used, that known as the Speigler-Jolles. This is done by adding sulphate of magnesium; the efficiency of the fluid is not interfered with in any way. Fifty c.c. of a saturated solution of sulphate of magnesium are added to a mixture containing 2 grams of corrosive sublimate, 4 grams of succinic acid, 4 grams of common salt and 50 c.c. of water. The urine is first acidified by adding 1 c.c. of acetic acid to 5 c.c. of urine; filter. Then, by the aid of a pipette the urine is slowly floated on the surface of the reagent in an inclined test-tube. If a ring of albumin appears, then heat. The albumin will not disappear. Further examination should be made for globulin, nucleoalbumin or mucin, and the albumoses. The test is exceedingly delicate, is easy of application, simple to prepare, and absolutely free from fallacies.

Cleveland Medical Journal.

April.

53 *Clinical Report of Nine Cases of Diabetes Insipidus. (Continued.) T. B. Futcher, Baltimore.
54 Phlyctenular Ophthalmia. A. R. Baker, Cleveland.
55 Eyestrain and Reflex Disturbances. E. P. Morrow, Canton, Ohio.
56 *Cesarean Section with Torsion of Uterus, Due to Ventrofixation. H. H. Powell and F. E. Bunts.

53. **Diabetes Insipidus.**—After reporting 9 cases of this affection Futcher reviews the clinical history. Four of the cases belonged to the so-called idiopathic group and 5 to the secondary or symptomatic group. All the latter showed very striking cerebral manifestations, and 4 were undoubtedly syphilitic in origin. Thirst appears to be the first symptom complained of in the majority of cases. The knee jerks are usually exaggerated, contrary to the usual findings in diabetes mellitus. In the 9 cases reported they were exaggerated in 5, diminished in 2, normal in 1 and not noted in 1. All the patients with exaggerated knee jerks had cerebral manifestations. There is no constant anatomic finding at autopsy characteristic of the disease. The most frequent changes are enlargement of the kidneys, congestion of the vessels, and dilatation of the tubules. In the symptomatic cases the organic lesions are variable. The prognosis is good in the so-called idiopathic cases, the disease not tending to shorten life. It is graver in the symptomatic cases, emaciation and general weakness often developing rapidly. Death may occur early in the latter group. The treatment in the majority of cases is very unsatisfactory. Opium, ergot and valerian effect only temporary benefit. The cases which appear to do best are those of luetic origin. Antisyphilitic treatment usually promptly relieves the cerebral manifestations and improves the general health and nutrition. Although potassium iodid may cause a decided diminution in the polyuria and polydipsia, it is seldom that these symptoms are completely relieved. The most striking effects, however, are manifested in the improvement in the cerebral symptoms, and in the gain in weight after the patients have been placed on the antisyphilitic treatment.

56. **Torsion of Uterus, Ventrofixation; Cesarean Section.**—In the case reported by Powell and Bunts it became necessary to interrupt gestation because of severe lumbar and hypogastric pains. The uterus failed to respond to introduced bougies on account of its firm adhesion to the abdominal wall. It could not rise up from the spinal column, giving an increase of its perpendicular diameter at the expense of its transverse. The uterus was in a state approximating tonic contraction. After making continuous efforts at dilatation, which resulted in failure, it was decided to perform a cesarean section. On opening the abdomen it was found that the uterus was attached to the abdominal wall at a point about six inches from its fundus by a very short broad ligament. Attached to this ligament also was a portion of omentum. On manipulation the uterus gradually began to contract, and after severing the adhesions it made a complete rotation on its cervical axis, showing that the fundus had escaped in the process of enlargement from beneath the band of fixation and rotated about this as a center. A piece of silkworm gut used for fixation five years previously was found in the band of adhesion.

Journal of the Medical Society of New Jersey, Newark.

April.

57 Gastro-uterine Disease. J. M. Rector, Jersey City, N. J.
58 An Accidental Nephrectomy. E. W. Hedges, Plainfield, N. J.
60 *Some Principles of the Diagnosis of Incipient Insanity. W. H. Hicks, Newark.
61 Medical Societies and Preventive Sanitation. T. N. Gray.
62 *Injuries to the Vaginal Tract During Childbirth, Their Significance and Correction. E. Marvel, Atlantic City.
63 *Treatment of Ano-rectal Fistulæ. A. H. Lippincott, Camden.
64 Conservatism in Medicine. C. Knecht, Matawan, N. J.

60. **Diagnosis of Incipient Insanity.**—The symptoms of mental dissolution are summed up by Hicks as follows: 1. Mental pain—depression. 2. Loss of interest and energy; lack of decision—vacillation. 3. Inattention—absent-mindedness. 4. Decline in object consciousness. 5. Rise in subject consciousness. 6. Decline in the rational elements of the perceptive powers. 7. Marked fatigue of conscious effort. 8. Indifference to welfare of the lifelong cherished ideals of the empirical self. 9. Lessened seriality of thought-incoherence—forgetfulness. 10. Change of disposition, affections and habits, suspicious deceptive. 11. Blunted sense of the social, moral and ethical proprieties. 12. Restricted volition—false judgment. 13. Delusions, hallucinations, destructive impulses, etc. 14. Genesis of a new, confused or illogical ego.

62. **Injuries to the Vaginal Tract.**—Marvel summarizes his paper as follows: 1. Vaginal lacerations are the most common injuries met by the mother in childbirth. 2. Vaginal lacerations produce organic and complex symptoms. 3. Assistance can be given the mother to prevent entirely, or to lessen in extent, her injuries. 4. The only treatment is operative, the earlier the better, and the success of this depends on securing true approximation of the torn parts.

63. **Treatment of Ano-rectal Fistulae.**—The procedure of operation and after-treatment of these cases in the main must be governed by the conditions presented by each individual case. In ordinary cases, however, Lippincot operates as follows: After having had the bowel thoroughly emptied the day before, and the patient put on liquid diet, the field is prepared as in any operation. After the patient is anesthetized he is placed in the dorsal position, the legs being held by means of the clover-crutch. The fistula is probed to give the operator some idea of the direction of the main tract. The sphincters are slowly and gently but thoroughly dilated and the lower part of the bowel is irrigated with a salt or creolin solution. The grooved director is introduced through the main tract and through the internal opening, bringing the end of the instrument out at the anus. With a curved bistoury or scissors the bridge of tissue is divided above the director. It is very important to cut at right angles across the sphincter muscle, thus lessening the danger of fecal incontinence. As much of the sphincter muscle as possible is preserved and the internal sphincter should not be cut more than once. If the fistula is of the horseshoe variety, and by a complete extirpation much damage would be done to both sphincters, it would be safer to do a secondary operation later. After the tract is laid open the back wall of the fistula is incised, thoroughly curetted, and with the curved scissors all fibrous scar tissue is carefully trimmed away. All overhanging edges and the outer edge of the wound are trimmed away, leaving a "V"-shaped wound having its apex at the back wall of the fistula. All bleeding vessels are ligated. After thoroughly flushing the lower bowel and the wound the latter is packed tightly with iodoform gauze, soaked in sterile olive oil, and dressed generously with layers of dry gauze, fastened in place with a T bandage. It is best for the bowels not to move during the first twenty-four hours; after that period there should be a daily evacuation. After twenty hours the first packing is removed. The wound should be dressed daily. After the third day the packing is discarded entirely. Unless the dissection has been a very extensive one the patient may be allowed to get out of bed after twenty hours. The early use of tonics and plenty of good, nourishing food is indicated.

Medicine, Detroit.

April.

65 *Clinical Value of Feces Examination. J. H. Salisbury, Chicago.
66 *Syphilis as Related to the Problems of Longevity. J. N. Hyde, Chicago.
68 Treatment of a Case of Severe Burn and Frost-bite Occurring in the Same Patient. J. F. Percy, Galesburg, Ill.

65. **Feces Examination.**—Despite the difficulty of the investigation and the incompleteness of our knowledge, the examination of the feces should occupy a most important place in diagnosis. The deviations from the function of digestion, continues Salisbury, are often only partly revealed by the symptoms, which in some cases may have no apparent connection with the organ affected, and may even simulate disease of an entirely different organ. Dyspeptic symptoms referred by the patient to the stomach, may depend on the condition of the small or large intestine, and vice versa, diarrhea or constipation may arise in consequence of abnormality in the gastric functions. Imperfection of the digestive processes will be indicated by the presence in the feces of undigested material, or of material which has undergone digestion but has failed of absorption. Evidence of the activity of the liver is afforded by the presence of urobilin in the stools. With marked disturbance of fat absorption, a failure more or less complete of fat-splitting, and the presence of much neutral fat, many undigested muscle fibers and free starch, the presumption is in favor of disease of the pancreas. The light thrown on func-

tional disturbance of the pancreas by the examination of the feces is at present, however, insufficient to permit very valuable conclusions to be drawn. The functions of the intestine may also be gauged by examination of the feces. Such examinations especially recommend themselves because of the accessibility of the material. No apparatus or disagreeable operation is necessary to secure it, as in the case of stomach contents, and the examination may be repeated as often as necessary without risk to the patient. The methods employed are exceedingly simple. Fifteen minutes will suffice for the necessary examination by one who has some little experience. No unusual skill is necessary.

66. **Syphilis and Longevity.**—Briefly stated, Hyde's conclusions in answer to the question, to what extent are the longevity prospects of a man or woman affected by the accidents of syphilis, are as follows: Syphilis may destroy life, or it may disfigure and mutilate the human body to a formidable extent. The disease should be counted among the dangerous scourges of the human family. Neither the physician nor the patient can afford to neglect skillful, energetic and prolonged treatment with a view to setting aside the possibilities of future danger. In the case of inherited syphilis, the fatality, working destruction alike of ovum, fetus and infant, varies between 80 and 90 per cent. of the infected. The percentage of fatality in acquired syphilis is probably less than 2 per cent., and results less often from the active invasion of the disease than from an entailed loss of resistance, by reason of which common agencies of disease produce serious effects, especially in the nervous system. The damage wrought by syphilis is not to be measured solely by its lethal issues. The lowering of the standard of health wrought by the inroads of the malady, and the moral result of the acquisition of the disease popularly described as loathsome, may jeopardize the best play of the body functions, pave the way for the inroads of other toxins, and possibly lay the foundation for mental degeneration, alienation and even suicide. The longevity prospects are unquestionably better for women than for men, by reason of the relative placidity of existence of the former.

New York State Journal of Medicine, New York.

April.

69 Acute Appendicitis and Abscess of the Liver. A. Rupp, New York.
70 Brief Story of a Smallpox Epidemic. E. Munson, Medina, New York.
71 *Prolonged Fasting as a Factor in Treatment of Acute Diseases. N. J. Sands, Portchester, N. J.
72 *Clinical Observations in Scarlet Fever, with Especial Reference to Heart and Other Complications; Therapeutic Suggestions. L. Fischer, New York City.
73 Methyl (Wood) Alcohol. J. P. Atchinson.
74 Legislative Aspects of Alcohol. M. N. Clement.

71. **Prolonged Fasting in Treatment.**—The question is raised by Sands whether we do not eat too much when ill. For many years he has advocated and practiced the opposite extreme of overfeeding—namely, absolute fasting in acute diseases of any grade of severity. His experience with prolonged abstinence from food as an aid in the management of acute illnesses dates back twenty-one years, when he first tried it, in a case of typhoid. Since then he has pursued this plan with all his typhoid cases, and has gradually extended it to the management of all acute diseases of any gravity. The digestive and assimilative powers of a patient are in abeyance in proportion to the severity of the sickness, and, on account of fever, possibly of toxins in the blood and of shock to the nervous system following sudden invasion of disease, nourishment fails to be appropriated to the benefit of the system and handicaps the patient's chances of recovery. He keeps his typhoid patients on a strict "water diet" for about twenty-one days. The amount of water which is ordered and insisted on for the patient to drink is at least two quarts in the twenty-four hours, until in the third week, when, with the falling temperature, less is desired. It should be taken pleasantly cool, not iced. The abdominal symptoms are practically nil; there is no diarrhea; no tympanites, no pain or tenderness. He has never had a case of severe hemorrhage, nor one of perforation, since the institution of this treatment. In gastrointestinal disorders other than typhoid, food is withheld until the symptoms have subsided. It is quite possible for a patient to fast three or even four weeks without the development of a more pronounced weakness than would be expected in any acute exhausting disease of such a duration.

72.—See abstract in THE JOURNAL of November 5, p. 1411.

Journal of Cutaneous Diseases, New York.

April.

75 *Acquisition of Syphilis Professionally by Medical Men. D. W. Montgomery.
76 *Some Cases of Diseased Nails. G. T. Jackson, New York.
77 *Ethyl Chlorid in Treatment of Zoster. H. Morrow, San Francisco.

75. **Acquisition of Syphilis Professionally By Physicians.**—The object of Montgomery's paper is to present a danger to which medical men are continually exposed, and to draw attention to the indifference they exhibit toward the terrible calamity of infection by syphilis. A number of instances in point are cited.

76. **Diseased Nails.**—Jackson reports a dozen cases of diseases of the nails for the purpose of directing attention to these affections, of which comparatively little is known at the present time.

77. **Ethyl Chlorid in Zoster.**—Used as a counter-irritant to overcome the severe pains of zoster, Morrow has found ethyl chlorid particularly effective. Patients who have not slept for days and who are in constant pain, can be greatly relieved by this treatment. An area the size of a dollar is frozen at a point where the nerve emerges from the spinal column. Although this usually relieves the pain along the entire nerve, it is better to freeze areas where the pain is localized. In some cases this treatment will relieve the pain for a day or more, whereas in others, only for a few hours. When this is the case there is no objection to applying the ethyl chlorid frequently. Morrow has treated ten patients successfully by this method.

Maryland Medical Journal, Baltimore.

April.

78 Intubation Experiences. W. T. Watson.
79 Abdominal Massage: Indications and Technic. R. Tauer, Baltimore.

University of Pennsylvania Medical Bulletin, Philadelphia.

March.

80 Congenital Defect of Abduction Associated with Retraction of the Eyeball. J. T. Carpenter.
81 Aneurism of the Descending Thoracic Aorta, Causing Erosion of the Vertebræ and Symptoms Simulating Pott's Disease. C. W. Burr.
82 Influence of Copious Water Drinking. P. B. Hawk.

Vermont Medical Monthly, Burlington.

February 25.

83 Experimental Study of Movements Produced in Stomach and Bowels by Electricity. G. G. Marshall, Wallingford, Vt.
84 One Hundred Pregnancies. L. H. Ross, Bennington.

St. Louis Courier of Medicine.

March.

85 Possible Victory over the Great White Plague. S. A. Knopf, New York City.
86 Early Diagnosis of Uterine Cancer. G. Gellhorn, St. Louis.
87 Baby Incubators on the "Pike." (Continued.) J. Zahorsky, St. Louis.
88 Etiology and Management of Brow Presentations. F. J. Taussig, St. Louis.
89 Left Hemiplegia. H. W. Soper, St. Louis.

New Orleans Medical and Surgical Journal.

April.

90 Therapeutic Paralysis. W. F. Waugh, Chicago.
91 Upper Respiratory Tract as Source of Systemic Infection. H. Dupuy, New Orleans.
92 Rare Form of Facial Spasm. R. M. Van Wart, New Orleans.

Louisville Monthly Journal of Medicine and Surgery.

April.

93 Chronic Gastric Ulcer. L. Frank, Louisville.
94 Hydrocele. T. L. Butler, Louisville.
95 Medical Education in the United States. S. G. Dabney, Louisville.
96 Growths in Larynx. J. M. Ray, Louisville, Ky.
97 Management of Acute Middle Ear Inflammation of Children. T. C. Evans, Louisville.

Medical Examiner and Practitioner, New York.

March.

98 Consideration of What Fraternal Societies May Do in the Crusade Against Tuberculosis. W. K. Harrison, Chicago.
99 Arteriosclerosis. O. Millard, Flint, Mich.
100 Iritis. Diagnosis, Prognosis and Treatment. D. H. Weisner, New York.

101 Cervix as a Guide in Locating the Fundus, and the Importance of Making an Early Diagnosis in Inflammation of the Cervix Uteri. S. C. Jaques, New York City.
102 Insanity and Epilepsy in Relation to Life Insurance. W. R. Gowers.

Virginia Medical Semi-Monthly, Richmond.

March 24.

103 Conservative Gynecology. C. R. Robins.
104 Volvulus Constituting Intestinal Obstruction Following Cesarean Section, with Uncertain Symptoms. J. N. Winston, Washington.
105 Movable Kidney—Its Causes, Symptoms and Diagnosis. B. L. Hillsman, Richmond.
106 Treatment of Erysipelas with Formalin. T. Dowling, Jr., Washington.
107 Causes and Symptoms of Nasal Obstruction. J. P. Davidson, Richmond.

Alabama Medical Journal, Birmingham.

March.

109 Some Points in the Technic of Gallstone Operations. G. S. Brown, Birmingham.
110 The Lawyer and the Doctor. E. Floyd, Birmingham.

Northwestern Lancet, Minneapolis.

April 1.

111 Suggestion in the Treatment of the Sick. O. F. Way, Claremont, Minn.
112 Binocular Radiography. C. D. Harrington, Minneapolis.
113 Operative Treatment of Fractures and Sprains. A. E. Benjamin, Minneapolis.

Albany Medical Annals.

April.

114 New Revision of U. S. Pharmacopeia. R. W. Wilcox.
115 Surgery of Twenty-five Years Ago. S. B. Ward.
116 Diagnosis of Acute Intestinal Obstruction. A. H. Traver.
117 Evolution of Surgery During the Past Twenty-five Years. A. Van der Veer, Albany.

Indiana Medical Journal, Indianapolis.

April.

118 Bacteriology of Puerperal Infection—Its Relation to Treatment. C. E. Ferguson, Indianapolis.
119 Isthmic Tubal Mole. L. J. Willien, Terre Haute.
120 President Garfield at Elberon. A. H. Smith, New York City.

Journal of the Kansas Medical Society, Lawrence.

April.

121 Embryos—Methods of Treatment. I. Hardesty, University of California.
122 Physician as a Business Man. J. T. Axtell, Newton.
123 Injuries to the Eye. J. W. May, Kansas City.
124 Radical Operation for Hernia. S. McKee, Leavenworth, Kan.
125 Autopsies. G. H. Hoxie, Lawrence.
126 Typhoid Fever. E. Smith, Lawrence.
127 Paresis. C. C. Goddard, Leavenworth.
128 Purulent Conjunctivitis. H. L. Alkire, Topeka.

Journal of the Mississippi State Medical Association, Vicksburg.

April.

129 Relation of Physicians to Each Other. J. H. Plunkett, McComb City.
130 La grippe. D. B. Stevenson, Poplarville.

Buffalo Medical Journal.

April.

131 Case of Cystic Goiter. N. Jacobson, Syracuse.
132 Multiple Herniæ. Large Angioma Hypertrophicum. W. S. Bainbridge.
133 Acute and Chronic Middle Ear Suppuration, with Special Reference to Treatment. G. F. Cott, Buffalo.

Canadian Journal of Medicine and Surgery, Toronto.

April.

135 Diphtheria Complicated by Subcutaneous Emphysema. W. J. Wilson, Toronto.

Southern California Practitioner, Los Angeles.

March.

136 Fundus as a Diagnostic Accessory. F. W. Miller, Los Angeles.
137 Symptomatology of Pneumonia. G. L. Cole, Los Angeles.
138 Complications of Pneumonia. W. A. Edwards, Los Angeles.
139 Massage—History, Theory and Practice. F. S. Seely, Los Angeles.
140 Typhoid—Five Divisions of Treatment. D. C. Strong, Redlands.
141 Study of the Unconscious Mind Under Stress of Bodily Disease. R. Moore.

FOREIGN.

Titles marked with an asterisk (*) are abstracted below. Clinical lectures, single case reports and trials of new drugs and artificial foods are omitted unless of exceptional general interest.

British Medical Journal, London.

April 1.

1 Some New Therapeutic Methods in Dermatology. M. Morris.
2 *Chronic Constipation; Its Medical and Surgical Treatment. W. A. Lane.
3 New Methods of Studying Affections of the Heart. (Concluded.) J. MacKenzie, Burnley.
4 *Diagnostic and Prognostic Value of the Leucopenia of Cachexial Fever and Kala-azar. L. Rogers.
5 Experimental Transmission of Mediterranean Fever. E. H. Ross and G. M. Levick.
6 Intermittent Fever in Malta. T. Zammit and G. C. Scicluna, Malta.
7 Ship Beri-beri. G. A. Turner, Kimberley, S. Africa.
8 Spirillum Fever in Uganda. A. D. P. Hodges and P. H. Ross, Uganda.

2. **Treatment of Chronic Constipation.**—Lane discusses particularly the conditions consequent on an imperfect evacuation of the large bowel. In the majority of cases this is associated with the symptoms popularly comprehended under the term constipation, but in a small proportion, while the large bowel up to the hepatic flexure or even to the splenic flexure may be constantly or frequently loaded, yet the patient obtains from the overflow a daily movement which is usually solid, and, consequently, makes no complaint of constipation. The large intestine, whose vitality has been depreciated, both by local inflammatory changes and by the general loss of tone, is thereby rendered liable to some specific infection, and ulcerative, membranous or other forms of colitis may develop in consequence. The condition frequently dates from a very early period, when, owing to the unsuitable feeding of a child, the intestines, and particularly the large bowel, are distended with gas, rendering the whole of the abdomen abnormally prominent. The cecum and ascending colon appear to suffer most severely, owing to the fact that this portion of the bowel is hung up at the hepatic flexure, which is rendered more acute by the distension and consequent elongation of the transverse colon in a downward direction. This distension, by dragging on the band which supports the splenic flexure, renders it difficult for the contents of the transverse colon to pass into the descending colon. In consequence of this distension, the large bowel becomes more or less inflamed, and this inflammation may be sufficient to produce a distinct peritonitis, as manifested by effusion. The inflammation of the cecum and ascending colon produces an adhesive process between the outer wall of the bowel and the peritoneum. These adhesions help to support the increasing weight of this portion of the bowel and to some extent oppose its distension and downward displacement. Precisely similar changes take place at the splenic flexure. After a time these adhesions develop into distinct mesenteries and strong bands. The bowel is less able to perform its functions; the intestine finally becomes bound down; the sigmoid is so contracted up that it ceases to be a loop and forms a straight conduit, the presence of the inflamed bowel in the true pelvis interferes with the functions of the ovary and the fallopian tube, and in this way constipation would appear to play an important part in the sterility so common among women. The stomach function is finally interfered with and the kidneys become mobile. The treatment is purely operative.

4. **Leucopenia of Cachexial Fever and Kala-azar.**—The diagnostic and prognostic value of leucopenia in the so-called cachexial fever and in kala-azar is considered by Rogers. A very marked decrease in the leucocytes is always found in uncomplicated cases of cachexial fever, and when they number below 2,000 per cubic millimeter this is almost diagnostic of the disease, but may rarely occur in true malarial cachexia. In cachexial fever the white corpuscles are reduced to a greater degree than the red, so that the ratio falls below 1 to 1,000 in all uncomplicated progressive cases. This is rarely so in true malarial cachexia, while a reduction in the ratio to below 1 to 1,500 appears to be quite diagnostic of cachexia from other Indian fevers. The most marked degrees of reduction of the leucocytes, and especially of the polynuclears, is of bad prognostic import, and *vice versa*.

The Lancet, London.

March 25.

9 Industrial Anthrax. T. M. Legge.
10 Physiology and Treatment of Surgical Shock and Collapse. J. P. L. Mummery.
11 *Relation of the Parasitic Protozoa to Each Other and to Human Disease. E. J. McWeeney.
12 *Treatment of Pleuritic Effusion by Paracentesis and Incision in Serous Effusion, Empyema and Pyopneumothorax. S. West.
13 Case of Intrapelvic Extravasation of Urine. D. Lowson.
14 Pre-menstrual Pregnancy in a Girl Aged 13 Years. A. W. Addinsell.
15 Case of Chronic Intestinal Obstruction with Perforation of the Sigmoid Flexure. G. A. Clarkson.

April 1.

16 *Growth of Cancer. E. F. Bashford.
17 Industrial Anthrax. T. M. Legge.

18 *Physiology and Treatment of Surgical Shock and Collapse. J. P. L. Mummery.
19 Pericolitis Sinistra. H. D. Rolleston.
20 Vibrating Sensation in Affections of the Nervous System and in Diabetes. R. T. Williamson.
21 Case of Pressure Statis. R. L. Joynt.
22 Carcinoma of the Bronchus and Liver Associated with Glycosuria in a Youth. G. Hall and R. H. Tribe.
23 *Soluble Button for Intestinal Anastomosis. P. Paterson.
24 *Crounotherapy in Exophthalmic Goiter. W. B. Jones.

11. **Relation of Protozoa to Disease.**—McWheeny's paper is a brief survey of the advances made during the past three years in our knowledge of the disease-producing protozoa, their biology and their relation to human diseases.

12. **Treatment of Pleuritic Effusion.**—The indications for these operations, indications against, and methods of their performance, are discussed by West.

16. **Growth of Cancer.**—According to Bashford, cancer is identical in all vertebrates, and in growing accommodates itself in a striking manner to the time limitations imposed by the compass of life in different animals. Under favorable experimental conditions the growth of the cancer is undefined, of enormous and limitless amount. Artificially propagated cancer displays all the characteristic features of the growth of sporadic tumors. The growth of artificially propagated cancer is due to the continued proliferation of the parenchyma cells. They cause no symptoms in the organism to which they have been added. The power of differentiation is definitely in one direction only, even three and a half years after separation from the original host. The number of chromosomes constant for the healthy body tissue is retained, notwithstanding the recurring reduction of this number to the exact half. The balance of evidence is in favor of the growth being interrupted and not uniform and continuous. From the standpoint of therapeutics the investigations of the Imperial Cancer Research Fund thus far establish the early surgical treatment of cancer, and of the conditions suspicious of cancer, on that experimental and rational basis which has hitherto failed. Artificially propagated tumors produce metastases as do sporadic tumors. Sufficiently early removal of the local transplanted tumor removes metastases from the region of possibility, and the immediate practical outcome of the whole investigation is a strong experimental justification of early operation in cancer.

18. **Treatment of Surgical Shock and Collapse.**—As causes of these conditions, Mummery mentions exhaustion of the vasomotor centers, and the resulting great fall in blood pressure; lowering of blood pressure from hemorrhage or from paralysis of the vasomotor centers; the anesthetic, and the time consumed in performing the operation. Ether and the C. E. mixture are the best anesthetics for cases in which there is danger of shock. In the treatment of shock stimulants, and especially strychnin, are absolutely contraindicated. The position with the head down and the foot of the bed raised, is of considerable value in the treatment of shock and should be more extensively used. So too, compression of the abdomen, either manually or by the application of a tight abdominal binder. The intravenous infusion of salt solution raises the blood pressure in all degrees of shock, but as a method of treatment it is disappointing because its action is fleeting and can not be continued indefinitely. The introduction of saline solution into the abdomen at the end of an abdominal operation is a valuable method of combating shock, and is not contraindicated by the presence of pus in the abdominal cavity. Mummery believes the best line of treatment in the event of shock occurring or threatening during an operation is the following: If the operation is an abdominal one, the peritoneal cavity should be filled, before being closed, with physiologic salt solution, and if a severe degree of shock is already present, adrenalin should be added to the solution in the proportion of 1 in 40,000. Whether or not the operation be an abdominal one, a firm tight abdominal binder should be applied at the end of the operation, and in bad cases, in addition, the limbs should be firmly bandaged from the extremities upward. Raise the foot of the bed, keep the patient warm and administer some good nutrient enema. No stimulants should be given. The hypodermic injection of ergot is indicated at the earliest sign of shock and should be repeated if any improvement in pulse tension follows its administration. Except where absolutely contraindicated, an injection of morphin should be given at the end of the operation, and if there is any restlessness afterward the morphin should be repeated. If, in spite of these measures, the blood pressure remains low, and the patient continues in a dangerous condition of shock, a solution of adrenalin in physiologic salt solution, in the proportion of 1 to 20,000, should be intravenously infused at a rate of about 3 to 5 c.c. a minute. The infusion should be continued until, on stopping it, the blood pressure is found to remain at a safe level. In collapse following severe hemorrhage intravenous infusion with physiologic salt solution should be performed as soon as possible. The amount of fluid introduced into the veins should be as nearly as possible equal to the amount of blood lost.

23. **Button for Intestinal Anastomosis.**—Paterson has devised a button or bobbin made of gelatin which has been treated with chrome alum. Besides being easy of manipulation and remaining *in situ* for the necessary length of time without injuring the intestine, the button has the additional recommendation that it can be prepared in such a manner as to be more or less resistant to the action of the digestive secretions according to the activity of these in the part operated on, or to suit the particular purpose which the surgeon may have in view. By varying the strength of the solution or the time that it is allowed to act, or by both these means, almost any degree of insolubility can be obtained. Paterson has found that the most suitable strength for intestinal buttons is 10 grains of chrome alum dissolved in one ounce of cold water. The buttons, which are not unlike Murphy's in shape, are made by pouring a strong watery solution of gelatin into molds of suitable size, these having been previously lined with a layer of strong muslin or dressing cloth. This fibrous material becomes saturated with the gelatin and incorporated with the outer part of the button and gives additional strength whilst at the same time it diminishes the tendency to brittleness. When the gelatin has set, the casts are removed and placed in the chrome solution, of which there should be an ounce or so for each button. Casts up to three-quarters of an inch in diameter should soak for from ten to twelve hours. They are then kept in 50 per cent. alcohol until required. It is important to note that when finished a projection on the male part of the button should fit accurately the opening in the female half so that some pressure is necessary to send it home, and to increase this adhesion it is better to have the two made slightly oval in section. A button three-quarters of an inch in diameter, prepared as described, resists solution for from five to seven days. The method of fixing this support is almost the same as that employed in using Murphy's button. A purse-string suture is passed around each end of the divided intestine, and the button, which has its halves opened but not quite detached, is placed in position and the sutures are pulled tight and tied. Should the parts of the button not fit tightly the opening in the female half should be smeared with a layer of thick hydraulic dental cement, and the ends then pressed together.

24. **Exophthalmic Goiter.**—Remarkable results were obtained by Jones in a case of exophthalmic goiter treated by crounotherapy. The patient was prescribed a course of the Llangammarch mineral water, a glass to be taken three times daily, and a course of baths, one on each alternate day. He was encouraged to take a moderate amount of exercise, including hill-climbing. He soon began to improve, the pulsations were less frequent and less violent and soon subsided to 94 per minute. Seven months afterward he was quite free from palpitation, attended to his business without discomfort, and walked several miles a day. The water used contains chlorid of barium, which has an action in slowing the pulse similar to that of digitalis.

Journal of Tropical Medicine, London.

April 1.

25 Elephantiasis of the Scalp. G. A. MacDonald.
26 Occurrence of Relapsing Fever in the Tropics and Its Relation to "Tick Fever." F. C. Wellman, Angola, West Africa.
27 Note on Occurrence of Filariæ in Fijians; from Blood Examinations. G. W. A. Lynch.
28 Effect of Drainage and Other Measures on the Malaria of Kland, Federated Malay States. M. Watson.

Annales de Dermatologie et de Syphiligraphie, Paris.

Last indexed page 1265.

29 (V. Nos. 8-9.) Les substances toxiques et immunisantes dans la syphilis. H. Hallopeau.
30 Contribution à l'étude clinique et histologique des manifestations cutanées de la leucémie et de la pseudo-leucémie. Nicolau.
31 *Syphilis et cancer. J. Etcheverry.
32 (No. 10.) De la blastomycose cutanée. W. Dubreuilh.
33 Report of V International Congress of Dermatology, Berlin, September, 1904.
34 (No. 11.) L'epithéliomatose pigmentaire, type de Unna (Seemannshautcarcinom). Dalous et Constantin.
35 Neuro-fibromatose généralisée avec molluscum pendulum de la moitié droite de la face et ptosis de l'oreille (with hypertrophy and ptosis of ear). Benaky (Smyrna).
36 Autopsie d'un cas d'adénome sébacé de Balzer. M. Pelagatti.
37 Osteitis Deformans and Inherited Syphilis.—Maladie osseuse de Paget et hérédo-syphilis. G. Etienne.
38 (No. 12.) *Le liquide céphalo-rachidien des syphilitiques en période tertiaire (cerebrospinal fluid). P. Ravaut.
39 Thirty-two Instances of "Syphilis by Conception," with Tardy Manifestations in Child or Mother or Both.—Syphilis conceptionnelle à manifestations tardives. L. Perrin.
40 Lymphangite nodulaire intra-labiale au cours d'un chancre syphilitique de la lèvre inférieure (lower lip). P. Delauney.
41 (VI, No. 1.) Le vernix caseosa, l'hérédo-séborrhée et l'acne fetales. L. Jacquet and Rondeau.
42 (No. 2.) Sur les relations du vitiligo et de la syphilis. G. Thibierge.
43 "Scrotal Tongue" in Grandmother, Mother and 3 Daughters.—Langue scrotale en série familiale. J. Payenneville.
44 Recherches sur l'alopécie atrophiante, variété pseudo-pélade. L. Brocq, Lenglet and Aurignac. (Continued from No. 1.)

31. **Syphilis and Cancer.**—Etcheverry believes that syphilis has an active influence on the development of cancer of the mouth, and that this influence is exerted by the preliminary leucoplasia providing a soil for cancer, by the cancer becoming installed in local lesions such as scars on the gums, etc., and by the general lowering of the resisting powers which the syphilitic infection induces. In his experience at Toulouse, he has had occasion to observe 13 cases of cancer following leucoplasia, and a still larger number in which the cancer developed in local syphilitic lesions in the mouth. He cites also a number of cases reported by others. In a third group of 15 cases the cancer developed in the mouth of a syphilitic without appreciable preceding local lesions. Under energetic mercurial treatment the cancer continues its inexorable course while the syphilitic lesion, with which it is associated, shows the effect of the specific treatment. Potassium iodid seems to aggravate epitheliomata, but mercury may induce a transient improvement. The above considerations apply also, probably, to cancer of the rectum in syphilitics, but the literature on this subject is still very scanty.

38. **Cerebrospinal Fluid in the Tertiary Phase of Syphilis.**—Examination of the cerebrospinal fluid of 46 syphilitics showed it always normal when the manifestations of the disease were restricted to the skin, bones or mucosæ, with the exception of cases of perforation of the soft palate. When there were ocular lesions, the cerebrospinal fluid almost always showed evidence of a strong cytolytic reaction. The reaction is more intense the more recent the lesions, and it subsides as the lesion retrogresses. In old syphilitics without any apparent manifestations of the disease the cerebrospinal fluid was always normal. When the nervous system was affected, the fluid always presented indications of a reaction. Any cytologic reaction, therefore, in the cerebrospinal fluid in a syphilitic, isolated or accompanied by other manifestations of syphilis, is a sign that the nerves are affected, if the reaction can not be otherwise explained. The discovery of such a reaction should be a warning to institute specific treatment at once without waiting for further symptoms. The reaction in the cerebrospinal fluid should be accepted as a symptom fully as characteristic as a cutaneous or visceral lesion, requiring the same treatment. Ravaut even pleads that lumbar puncture should be practiced as a routine measure in syphilitics. By the information thus obtained the nervous complications, which are the more dangerous as they develop in such an insidious latent way, may be aborted or warded off by timely, energetic treatment.

Presse Médicale, Paris.

Last indexed page 1320.

45 (No. 12.) Epidémiologie de la méningite cérébro-spinale. A. Mandoul.
46 Les matériaux de l'urine (materials of urine). M. Labbé and H. Labbé.
47 *Traitement du tétanos par les injections épidurales de sérum antitétanique. G. Mornac.
48 (No. 13.) Le traitement de la tuberculose par les inoculations. A. E. Wright.
49 Action of Anesthetics on Blood.—L'action des anesthésiques sur le sang. P. E. Weil.
50 (No. 14.) *De la syphilis stomacale. G. Hayem.
51 *Aortite, tabes et paralysie générale. E. de Massary.
52 (No. 15.) La fièvre méditerranéenne en Tunisie. C. Nicolle and M. Triolo.
53 (No. 16.) Le radium en thérapeutique "Radiumthérapie." P. Desfosses.
54 Results and Improved Technic of Broncho-Esophagoscopy.—Des résultats généraux obtenus par la broncho-oesophagoscopie et des perfectionnements apportés à cette méthode. J. Guisez.
55 Glycerinated Dressings for Vagina.—Pansements vaginaux glycérinés. M. Sayanno.
56 (No. 17.) Tubercle Bacillus and Blood of the Tuberculous.—Le bacille de Koch et le sang des tuberculeux. A. Bergeron.
57 Abcès de la paroi abdominale du à la migration des vers intestinaux (of helminths). P. Sikora.
58 Etudes sur la pathologie et sur l'étiologie de la variole et de la vaccine. W. T. Councilman, G. M. Magrath, W. R. Brinckerhoff, E. E. Tyzzer, S. E. Southard, R. L. Thompson, I. R. Bancroft, G. N. Calkins.
59 (No. 18.) La scopolamine comme anesthésique général en chirurgie. F. Terrier and A. Desjardins.
60 Mécanisme des décollements epiphysaires (separation of epiphysis). A. Broca.

45. **Prophylaxis of Cerebrospinal Meningitis.**—Mandoul had occasion to study 6 cases of cerebrospinal meningitis occurring in the barracks at Angoulême in the course of four months. No regular period of incubation was evident, but the diplococcus was isolated from the cerebrospinal fluid in all. He examined mucus from the nose of 15 healthy men who had been in contact with the sick, and found a diplococcus resembling the virulent germ in all but 3, and actually virulent in 2 of the men. These 2 healthy persons harbored the virulent germ of cerebrospinal meningitis without injury. Another fact he noted was that the cerebrospinal meningitis had developed in every instance secondary to some affection involving the nasopharynx, such as grippe or measles. The natural conclusion from his finding is that periodical rinsing of the nasopharynx, to keep it as aseptic as possible, is the true prophylaxis of cerebrospinal meningitis.

47. **Epidural Injections of Antitetanus Serum.**—Mornac was not successful in curing the patient whose case he describes; the injection was not made until the fourth day of the tetanus. The improvement observed, however, the simplicity of the technic, and the technical success of the procedure as determined at the autopsy, justify further experiments in this line. He thinks that the epidural route is theoretically the one of choice in case the wound is on the legs. The chances for success are of course better the earlier the injection is made. He injected 20 c.c. three times in two days, with two more injections of 10 c.c. each on the third day. Apert has reported a case in which the patient recovered after epidural injection of the serum.

50. **Syphilitic Gastric Troubles.**—Hayem reviews 4 typical cases of tertiary syphilitic manifestations located in the stomach. One type simulates an ulcer, as there is ulceration with hematemesis. Another type suggests benign stenosis, without a tumor. In the third type, there is a tumor in or near the pylorus, suggesting the possibility of cancer of the pylorus. The fourth type is a deceptive simulation of cancerous stenosis. The chemistry of the stomach, however, is liable to be that of an ordinary chronic gastritis. In the ulcerative form the analysis may suggest the findings of cancer. One of the 4 patients was 60 years old and presented the aspect of a cancer subject. No one thought of inquiring for syphilis in this case, but a history of a chancre forty years before was learned after the operation. If it had been suspected before, specific treatment would have been tentatively instituted, as there was no urgent haste, and the syphiloma might have subsided under it. In the absence of a history of syphilis Hayem would refrain from mercurial treatment in such a case as all unnecessary medication may do harm. The possibility of syphilis in presence of a serious stomach affection of obscure origin should not be forgotten. If it is even probable or possible, mercurial treatment may do wonders, and may avert the necessity for surgical intervention.

51. **Aortitis, Tabes and General Paralysis.**—De Massary has had 2 patients who applied on account of aortitis alone, but his examination revealed incipient tabes. In others the vascular

affection that brought them to the physician was accompanied by an unsuspected general paralysis. He urges the necessity for minute investigation of the nervous system in every case of a vascular affection of a possibly syphilitic origin.

Berliner klinische Wochenschrift.

62 (XLII, No. 9, February 27.) Zur Natur des Heufiebergiftes und seines spezifischen Gegengiftes (hay fever toxin and antitoxin). C. Prausnitz (Hamburg).
63 *Neumann's Orcin Test for Sugar.—Die Brauchbarkeit der Orcinreaktion nach Neumann für die Zuckeruntersuchung des Urins. G. Mann.
64 Bismuth Poisoning.—Ueber Bismuth Vergiftung. W. Mahne.
65 *Permanent Results of Bloodless Reduction of Congenital Dislocation of Hip.—Dauerresultate nach der unblutigen Einrenkung angeborener Hüftverrenkungen. G. Joachimsthal.
66 Later Works on Bacteria of Tubercle-Bacillus Group.—Neuere Arbeiten über die Bakterien der Tuberkel-Bacillen-Gruppe. Kutscher.
67 (No. 10.) Favorable Influence of Temp. of 131 F. on Agglutination Test.—Ueber den Einfluss des Temperatur Optimums von 55° C. auf die Agglutination beim Fickler'schen und Widal'schen Versuche. K. Sadler.
68 Ueber die makroskopische Agglutinations-Probe bei Typhoid-Fieber. P. Aaser.
69 *Refrigeration in Treatment of Cutaneous Affections.—Gefrierbehandlung bei Hautkrankheiten. M. Juliusberg.
70 Ueber Meningo-Encephalitis serosa nasalen Ursprungs (of nasal origin). J. Herzfeld.
71 Der forensische Blutnachweis (forensic blood test). H. Marx.
72 (No. 11.) Complement in Blood in Tuberculosis.—Der Komplementgehalt des Blutes bei verschiedenen Formen der Lungentuberkulose. J. Kentzler.
73 Limited Dorsal Flexion of Foot in Peroneus Paralysis.—Ueber eine bisher noch nicht bekannte Begleiterscheinung der Parese des Nervus peroneus. H. Hirschfeld.
74 Action of Brine Baths.—Die physiologische Wirkung der Solbäder. T. Groedel II.
75 *Die moderne Behandlung der Herzleiden (heart affections). E. de Renzi.
76 Sunshine and Epidemic of Catarrhal Fever.—Beziehungen des Sonnenscheins zu der Saison-Epidemie des Winters 1904-05. J. Ruhemann.
77 Rapid Dilation of Cervix.—Einiges über die schnelle Dilatation des Cervicalkanals und über die Bedeutung der Dilatationsmethoden für den Praktiker. Stoeckel.

63. **Neumann's Orcin Test for Sugar.**—Mann praises this test as not only more sensitive than the Nylander and Trommer tests, but as serving to differentiate various kinds of sugars with the single and very simple test. The color reaction differentiates the various hexoses and these from the pentoses.

65. **Permanent Results of Bloodless Reduction of Congenital Dislocation of Hip Joint.**—Joachimsthal presents radiograms of a number of patients treated years ago by bloodless reduction. The remote results have been perfect cures in 60 per cent. of the cases, while in the others mere transposition of the head was all that was accomplished. He regards this percentage as very promising. This method of treatment and after-treatment, he is convinced, makes less demands on the patient than other methods, while experience has shown that the results remained permanent under years of observation.

69. **Refrigeration in Treatment of Cutaneous Affections.**—Juliusberg states that carbonic acid is the refrigerating fluid preferred for this purpose at Neisser's clinic at Breslau. The surface is sprayed with the carbonic acid as when making frozen sections. The broad, perforated nozzle of the vial is held about 1 cm. from the skin, and the fluid is forced out by a bulb. In half a minute the skin is frozen hard. There is anemia at first; this is followed by intense hyperemia, and half an hour later by profuse serous transudation. In twelve hours an inflammatory redness develops, with blisters. When the freezing has been very intense, actual ulceration may follow. When it is necessary to repeat the application, an interval of five to ten days is interposed. Three sittings in less than a month are generally sufficient. This method of treatment proved particularly effectual in 9 cases of lupus erythematodes thus treated. From 3 to 9 applications were made and the patches healed remarkably promptly, but traces of recurrence became visible after a few months, showing that the refrigeration needs to be combined with some other measure to ensure permanency. He thinks the ideal combination is with crude hydrochloric acid, according to Dreuw's technic, described in these columns, page 2002 of the last volume, substituting carbonic acid for the ethyl chlorid. Tuberculous skin affections are evidently the chosen field for this mode of treatment when phototherapy is impracticable for any reason. A lupous patch about six months old, on the forearm, healed with a keloid cicatrix after two applications of the carbonic acid and hydrochloric acid. In another case, two lupous patches on hand and arm ulcerated at first under three weeks of the combined treatment, but then healed over smoothly. All were favorably influenced and apparently cured to date. The experiences at the clinic were with psoriasis, primary sores, leg ulcers and sycosis, besides the tuberculous affections. The primary sores all healed rapidly after a single application of the refrigeration and hydrochloric acid before mercurial treatment had been instituted.

75. **Modern Treatment of Heart Affections.**—In that part of his article devoted to prophylaxis, De Renzi urges that greater attention should be paid to warding off and to treating the affections which we know favor the development of a cardiopathy. Acute articular rheumatism stands in the front rank in this respect, and he asserts that the physician should not be content to treat it with mild measures, but should combat it vigorously. Doses of from 6 to 8 gm. a day (3iss to 3ii) are none too large. The physician content with less is liable to be doing his patient great harm. These large doses may induce symptoms of salicylic poisoning, but the danger of a mild and transient intoxication is slight in comparison with the danger of permitting an incurable heart affection to become installed because the articular rheumatism has not been adequately treated. The delay of a day or even of a few hours may allow the inception of a fatal cardiac defect which might have been avoided. Gout and obesity should be treated promptly for the same reason. He protests against Huchard's advocacy of repose as beneficial to heart patients. His own opinion is directly contrary. He believes that exercise trains and strengthens the heart, and is the sovereign remedy for all cardiopathies. Cardiac defects are benefited as the heart becomes hypertrophied, and the heart muscle develops as it is exercised.

Deutsche medizinische Wochenschrift, Berlin and Leipsic.

78 (XXXI, No. 9, January 31.) Experiences with Early Operating in Appendicitis.—Erfahrungen mit der Operation der akuten Epityphlitis in den ersten 48 Stunden. J. Rotter.
79 Thrombophlebitis mesaraica, eine verhängnisvolle Komplikation der Appendicitis. E. A. Polya. (Commenced in No. 7.)
80 New Form for Administering Iron.—Eine neue Form der Eisendarreichung. P. Meissner.
81 Zur aktiven Therapie des Abortus. A. Sittner.
82 Progress in Care of the Sick.—Fortschritte der Krankenpflegetechnik. P. Jacobsohn. (Concluded.)
83 (No. 10.) Principles for Treatment of Mental Affections.—Grundzüge zur Behandlung der Geisteskrankheiten. O. Binswanger.
84 *Progress in Treatment of Suppurative Perforation-Peritonitis.—Ueber unsere Fortschritte in der Beurteilung und Behandlung der eitrigen Perforations-Peritonitis. Barth.
85 Ueber die Scopolamin-Morphium-Narkose. Dirk.
86 Ueber die Verwendbarkeit des Panendophon zur Feststellung der Organ-Grenzen (unfavorable verdict on modified phonendoscope). O. Kaiserling.
87 *Ueber Herz-Perkussion (of heart). Goldscheider.
88 Great Differentiating Value of Koplik's Spots in Measles.—Ueber die Bedeutung der Koplikschen Flecke für die Diagnose und Differential-diagnose der Masern. H. Brüning.
89 Recent Legal Decisions in Medical Matters.—Die Rechtsprechung in ärztlichen Angelegenheiten. Flügge.
90 (No. 11.) Treatment of Gout.—Die Behandlung der Gicht. O. Minkowski.
91 *Diphtheria Antitoxin as Protective.—Ueber Schutzimpfungen mit Diphtherie-Heil-Serum. J. Ibrahim.
92 Zur Kasuistik der hysterischen Schlafzustände (sleep). C. Bruck.
93 Ueber Wirbel-Frakturen (of vertebræ). O. Croce.
94 Quinin as Oxytoxic.—Ueber Chininum sulfuricum als wehenverstärkendes Mittel. J. Backer.
95 Rapid Embedding.—Ueber Aceton-Celloidin-Schnelleinbettung. F. Scholz.
96 *Filariasis in Tropics.—Beitrag zur Filariakrankheit der Menschen und Tiere in den Tropen. H. Ziemann.
97 Results of Bacteriologic Research in 1905.—Rückblick auf bakteriologische Forschungsergebnisse des Jahres 1904, die von allgemeinerem Interesse sind. Meinicke.
98 Zur Prophylaxe der Rezidive bei Erosionen der Hornhaut (of cornea). H. Feilchenfeld.
99 Plague in Northern China.—Die Pest in Nord-China im Herbst 1903. Eckert.
100 Zum 100. Geburtstage des Sängers Manuel Garcia, des Begründers der Laryngoskopie. A. Jurasz.

84. **Treatment of Perforation Peritonitis.**—Barth counsels early operating and extols the benefits liable to be derived by enterostomy even in apparently desperate cases of peritonitis caused by perforation. He has saved 7 out of 11 patients by this means in the acute phase of peritonitis. One patient was a boy with ileus from progressive peritonitis. The intestine was punctured at three different places and the child recovered. In another case, the intestine was punctured at two

places with a similar favorable result. The contracting power of the intestine is the guide to intervention and the criterion for the prognosis. When the intestine is paralyzed, the contents of the loop that is punctured are all that flows out, but when the intestine is still functioning then the feces are passed along and evacuated. If success is not complete in the next few hours or days—and siphoning out the stomach contents is the criterion for this—then there is every probability that a second obstacle exists, and a second or even a third puncture is needed. The technic is very simple. A loop of the intestine is drawn up through a short incision and sutured to the peritoneum. The puncture is made with a fine trocar at once or after tamponing for a few hours. After removing the metal guide, a rubber tube is fastened to the trocar, which is left in place. By this means the wound is kept from being soiled, while the hole in the intestine is so small that it usually closes spontaneously. The mechanism of ileus in case of perforation peritonitis may be open to question, but it is positive that a large proportion of the patients may be saved by enterostomy in time. The details of the 11 cases thus treated are appended.

87. **Percussion of the Heart.**—Goldscheider recommends extremely light, barely audible percussion, as by far the most instructive. Absolute silence should prevail, and the tracings of this extremely light percussion will be found to harmonize most perfectly with the findings of orthodiagraphy, etc.

91. **Diphtheria Antitoxin as a Prophylactic Measure.**—Ibrahim's extensive experiences at the children's clinic at Heidelberg speak convincingly in favor of the great value of protecting injections of diphtheria antitoxin. It confers immunity to diphtheria for three weeks at least, without fail; 250 to 300 immune units is the effectual dose. Children already having scarlet fever, whooping cough, and especially measles, should be given 500 units. The same dosage applies also to infants. In the contagious ward the injections should be repeated every four or, better still, every third week, and in case of measles, every second week.

96. **Filariasis in the Tropics.**—Ziemann has made a study at Kamerun of affections caused by the *Filaria perstans, Filaria bancroftii and Filaria loa.* He found the *Filaria perstans* in a number of Europeans, and noted that the cases of migrating, painful swellings and of multiple abscesses increased in parallel proportion. When the *Filaria loa* was found in the eye there was frequently a history of migrating swellings. Prophylaxis should be the same as for malaria, by annihilation of mosquitoes. No treatment proved effectual, but in one case the recurring migrating swellings were permanently banished by a course of baths at Kreuznach.

Münchener medicinische Wochenschrift.

101 (LII, No. 10.) *Two Cases of Extramedian Symphyseotomy.—Zur Indikation des Schambeinschnitts nach Gigli. O. v. Franqué.
102 *Functional Capacity of Female Mammary Gland.—Zur Leistungsfähigkeit der weiblichen Brustdrüse. O. Rommel.
103 Zur Morphologie der pathogenen Mikroorganismen, Diphtherie- u. Pseudo-Diphtherie-Bazillus. E. Saul.
104 *Significance of Pleurisy for Diagnosis and Treatment of Abdominal Affections.—Pleuritis in ihrer Bedeutung für Diagnose und Therapie der Abdominalerkrankungen. B. Auerbach.
105 *Ueber die Beziehungen von Infektion, Gefäss- and Blutdrüsen-Erkrankungen zur Sklerodermie. L. Huismans.
106 Zur differential-Diagnose der choreatischen Geistesstörung (mental disturbances). L. Ruppel.
107 Fall von disseminierter Fett-Nekrose infolge Schussverletzung des Pankreas (fat necrosis after bullet wound). R. Kindt.
108 Fall von Simulation epileptischer Krämpfe bei einem 13 jährigen Schulknaben (by schoolboy). Aronheim.
109 Neue elektrische Beleuchtungs- und Untersuchungs-Lampe (illuminator). F. Schaefer (Munich).
110 *Prevention of Puerperal Fever.—Zur Verhütung des Puerperalfiebers. H. Doerfler (Regensburg).
111 The Medical School of Fifty Years Ago.—Ein ärztlicher Rückblick auf ein halbes Jahrhundert (1855-1905). A. Riedel.
112 (No. 11.) *Action of Mercury.—Ueber Quecksilberwirkung. E. v. Düring.
113 *Quantitative Test for Air in Lungs.—Ueber die quant. Bestimmung des Luftgehaltes der Lungen, besonders bei Neugeborenen, eine Erweiterung der Lungen-Schwimm-Probe. J. Stumpf.
114 Influence of Fever, Infection and Kidney Injuries on Suprarenin Glycosuria.—Der Einfluss von Fieber, Infektion und Nierenschädigung auf die Suprarenin-Glykosurie. A. Ellinger and A. Seelig.
115 *Sigmoiditis chronica granulosa.—E. Helber.
115½ Zur Frage der Hämolysin-Bildung pathogener Staphylokokken-Stämme.—A. Lohr.
116 *Erfahrungen mit dem Uterus-Krebs in Nürnberg (cancer at Nuremberg). S. Flatau.
117 *Treatment of Sclerodermia with Mesenteric Gland.—Fall von zirkumskripter Sklerodermie, behandelt mit Mesenterialdrüse. C. Schwerdt (Gotha).
118 *3 Fälle von Morbus Basedowii. Peters.
119 Zur Kasuistik des Strümpellschen Zehen-Phänomenons (toe sign). H. Koerber.
120 Operative Treatment of Subcutaneous Rupture of Spleen.—Subkutane Zerreissung der normalen Milz und ihre chirurgische Bedeutung. Neck.
121 3 Cases of Veronal Poisoning.—Zur Kasuistik über das Veronal. W. Alter.
122 *Kolposkop. A. Foges (Vienna).
123 Double Tissue Forceps.—Dreiteilige Pinzetten. J. Hertzka.
124 Presence of Radium in Kreuznach Waters.—Das Vorkommen von Radium in den Kreuznacher Solquellen. K. Aschoff.

101. **Extramedian Symphyseotomy.**—The results in the 4 cases in which von Franqué has performed symphyseotomy by Gigli's extramedian technic, have been so favorable that he thinks its indications can be extended to include even infected cases. The edges of the wound separated in one of his patients, who had endometritis—acquired intrapartum—and although there was some temperature at times, the wound healed by granulation without suppuration and there was no cause for concern at any time.

102. **Technic of Nursing.**—Among the points emphasized by Rommel in his study of the best means to promote the nursing capacity, is the advisability of giving the child only one breast at a meal. This allows the one breast used to be thoroughly emptied, while the other breast has a doubly long rest. The longer the intervals between meals the hungrier the child, and the more energetically it sucks. This energetic sucking is the most important factor for the development of a good nursing capacity. The breast generally responds to energetic sucking with a copious secretion of milk; feeble sucking elicits but a feeble secretion. He has had wealthy women with weakly infants come to his maternity for a week or so to give the breast to strong, energetically sucking infants, while their infant was nursed by someone else with well-developed breasts. When they left their infants were much stronger, while their breasts had responded to the energetic sucking with a copious secretion of milk. A generous diet without any special restrictions should be advised. It seems to be immaterial whether the woman drinks milk or water for her beverage, but two to two and a half quarts of fluid should be ingested during the twenty-four hours. One of his wet nurses trained on these principles secretes 3,610 gm. of milk a day, and has been nursing five infants for several weeks, and is in robust health.

104. **Pleurisy Secondary to Abdominal Affections.**—Chance has thrown in Auerbach's way during the last few months 5 cases in which a pleural effusion was a secondary phenomenon accompanying an abdominal affection. The effusion was serous and sterile in 3 cases in which a puncture was attempted. The presence of the effusion was accepted as a sign of some suppurative affection in the abdomen below. This assumption was confirmed by the course of the case in every instance. When there are no symptoms, or merely slight symptoms pointing to the abdomen and the progressive inanition and temperature indicate some serious malady, a history of some stomach or gallstone affection or of a suppurative process in the abdomen or of some kidney or bladder trouble, will sometimes point the way; but still more suggestive is the discovery of pleurisy, even in a mild form, if a lung affection can be excluded. The pleural effusion justifies the suspicion of some suppurative process below the diaphragm, usually on the same side, and puncture confirms the diagnosis.

105. **Sclerodermia and the Vascular System.**—Huismans found the blood glands in a morbid condition as evidenced by the symptoms exhibited by the patient in the case of typical sclerodermia which he describes. From study of this case and of others in the literature he asserts that sclerodermia can not possibly be a pure neurosis in all its stages. There is evidently a neurosis of the sympathetic as the foundation for the affection, but it is unable alone, to produce the sclerodermia. Secondary infection of the blood glands and blood vessels is indispensable for this.

110. **Prevention of Puerperal Fever.**—Doerfler remarks that restless progress is apparent on every hand and in every field of human activity except one. The centuries have made no change in the midwife. (He evidently refers to the country

district of Bavaria.) She still examines, with dirty hands, the parturient woman, repeating the examination ten, twenty times, or even more, her finger nails still filled with the dirt from digging or washing potatoes or weeding the garden. He insists that the law should compel her to wear rubber gloves when making an examination, and that all water used about the parturient should be boiled, and that the vaginal douche should be legally forbidden. He states that Bavaria has nearly 5,000 midwives and they take charge of about 215,000 childbirths annually. The state should supply the necessary rubber gloves. Prevention of puerperal fever would also ward off the consecutive gynecologic troubles and invalidism of the wife and mother, and the defective development of children born later.

112. **Action of Mercury.**—The synthetic production of indigo has been a comparatively difficult process until recently, when it was learned that the addition of a little mercury induced catalysis with which the synthesis proceeded rapidly and smoothly to its consummation. This induced Schade to study the electric catalytic action of mercury since this discovery, and he has learned some interesting facts which throw light on the action of mercury in the organism. The catalytic processes are practically independent of the amount of the catalyzer; the extent of catalyzing surface is the main thing. The more finely divided the mercury, the greater the catalyzing surface and the greater its catalytic action. Guaiacol or naphthol added to H_2O_2 causes a change in the color of the fluid from the oxidation that slowly proceeds in it. This oxidation is promptly activated if a little mercury or other heavy metal be added to the fluid. The metal does not cause any chemical reaction in the fluid, but accelerates to a remarkable extent the oxidation processes.

113. **Quantitative Test for Air in Lungs.**—Stumpf hooks to the lungs to be examined a small wire basket, like a tea-strainer, and places the whole in a jar of water. He then puts some shot or other weights in the wire basket until the lung is weighted down by them and begins to sink. He has found that each gram of the weight corresponds to 1 c.c. of air. His experience has further shown that adult lungs weighing as much as 1,500 to 1,600 gm. with 800 c.c. and over of air, are encountered only in case of death from suffocation or of sudden death which had more or less of the character of suffocation. When the weight of the lung is surpassed by the figure representing the amount of air, this finding speaks for death from drowning. The probability of death from hemorrhage is increased as the figure representing the amount of air approaches the weight, if it is low. A high weight, with small amount of air, suggests the probability of some preceding inflammatory process or morbid changes in the lungs or a protracted death agony. He applies the term *Lungentragfähigkeit*, or "capacity of holding up," to the figure which represents the amount of the weight required to submerge the lung. He points out that the temperature of the water in which the lung of the newborn is floated has great influence on the outcome of the test.

115. **Chronic Granular Sigmoiditis.**—Helber records a case of recurring sigmoiditis distinguished by the characteristic symptoms of frequent hemorrhages, exaggerated mucus secretion and tendency to spasmodic contraction. There was pain in the region of the left tube, due to pressure on the inflamed segment of the intestine. Constipation was obstinate, but there was no tenesmus. The first symptoms had been pains in the upper abdomen and stomach, probably due to spasmodic contraction in the colon with stagnation of feces. The endoscope showed intense inflammation in the descending portion of the sigmoid flexure, stopping about 2 to 3 cm. below the junction of the flexure with the rectum. A gonorrheal origin was possible. Treatment included rest in bed, compresses externally and opium internally, with injections of water for the coprostasis. After the spasmodic contraction had subsided, high enemas with from .5 to 1 per cent. tannin were found useful, with application of a 5 per cent. solution of silver nitrate directly to the parts, through the endoscope. The parts swabbed with the silver were not bleeding when inspected again through the endoscope. The patient was thus cured of the debilitating daily hemorrhages.

116. **Uterine Cancer at Nuremberg.**—Flatau analyzes his experiences with the 259 cases of cancer of the uterus which he has had occasion to observe during the last twelve years. They formed 1.95 per cent. of his total gynecologic practice. He found that a number of the patients had been previously under medical care, but in more than 10 per cent. the physician had neglected to make a digital examination of the genitalia. Only 12 of the 121 patients operated on are permanently well to date. All the others have succumbed to recurrence. Eight of these 12 were cases of carcinoma of the body of the uterus. Discharge and bleeding had been noticed by the patients for from two weeks to a year before they applied to the physician.

117. **Organotherapy in the Treatment of Circumscribed Sclerodermia.**—Schwerdt believes that neurasthenia, enteroptosis, exophthalmic goiter, myxedema and sclerodermia are intimately connected. He is convinced that sclerodermia is an affection due to the passage of some intestinal toxin into the chyle vessels. This toxin passes unaltered into the blood if the mesenteric glands fail in their functions. He has treated a case of sclerodermia on this assumption, administering the substance of the mesenteric glands, and reports the progressive improvement of the patient to almost complete cure at present. He theorizes to explain how the hardening and impermeability of the subcutaneous lymph glands and lymphatics would induce the picture of sclerodermia, especially the circumscribed form. He uses the mesenteric glands of sheep, in powdered form or in tablets of .3 gm. each. His patient was a girl of about 8, and she took the one tablet a day. There were no subjective disturbances.

118. **Exophthalmic Goiter.**—In a severe case described, all the symptoms spontaneously retrogressed under careful hygiene. The 2 other patients made remarkable improvement under organotherapy.

122. **Colposcope.**—The instrument for visual inspection of the vagina is a broad, short tube with a transparent glass cap. The tube is inserted in the vagina, closing the opening, and the vagina is inflated through it with a double air bulb. As the air distends the walls of the vagina, they can be inspected through the glass cap. Foges adds that he has recently learned that a similar instrument was presented by Laws in 1900, under the name of the pneumatic sigmoidoscope.

Gazzetta degli Ospedali, Milan.

Last indexed page 752.

125 (XXV, No. 145.) *Bulging of Pyloric Region.—Bozza pilorica. S. Mircoli.
126 *Action of Antimony on Blood.—Azione dell' antimonio sul sangue. S. Montemagno.
127 *Resultati del metodo Fiorani nella cura degli angiomi (angiomata). F. Bindi.
128 *Febrile Malarial Enterorrhagia.—Sulla febbre enterorragica da malaria. D. Scozzati.
129 Della polimiosite primaria. A. Prandi.

125. **Pyloric Bulging.**—In an abstract in these columns, on page 752, Mircoli's previous communication on this subject was summarized. He applies the term *bozza pilorica* to the bulging sometimes noted in the epigastrium with the stomach empty. He here presents arguments to sustain his idea that the human stomach is really the rudiments of four distinct organs, that is, of the four stomachs of the ruminants. The fundus, the body, the antrum, and the pylorus each represents one of these ancestral organs. The antrum is particularly distinct from the rest of the stomach, especially during the digestive period. The antrum is eminently a motor organ, with scanty elaboration of gastric juice, while the rest of the stomach is very slightly motor and predominantly secretory in its functions. The secretion of the body of the stomach is acid; that of the antrum is decidedly alkaline. During the process of digestion the antrum works differently from the rest of the stomach, its systole and diastole serving to pump the contents along, and serving, besides, as regulator to hold back or to pass along the chyme. In morbid conditions, the antrum may work excessively, outside of digestion, and may show as a bulging in the epigastrium. The bulging may be due to spasm of the two sphincters, on each side of the antrum, or it may be due to loss of the muscular tone of its walls from neuromuscular influences, or it may be referable to infiltra-

tion of the walls by some primary or secondary catarrhal process, or to all these causes together. The initial clinical manifestations of the pyloric bulging only slightly resemble those of gastrectasia. On the other hand, the general symptoms are particularly marked, and in the majority of cases assume the aspect of essential neurasthenia, that is, they present a syndrome apparently not imputable to the stomach. The discovery of the bulging explains other puzzling manifestations, and it also allows the gastrectasia to be combated in time. Treatment should be both dietetic and mechanical, and should include the wearing of an abdominal band to support all the viscera, but especially the antrum and the pylorus region. Such a support gives a more solid foundation for the motor functioning of the stomach to work on. Sodium sulphate or its equivalent may be given or a little nux vomica. The study of stomach affections in general and of gastrectasia in particular should be directed along different lines from those hitherto followed. The stomach should be regarded from the standpoint of its structure, its function and its pathology as a multiple organ, double at least, whose two segments can become morbidly affected together or alone, independently of each other.

126. **Action of Antimony on Blood.**—Montemagno's experiments on dogs and rabbits demonstrated that minute doses of antimony improve the composition of the blood as they increase the proportion of hemoglobin, the number of red corpuscles and their resisting powers. This improved composition of the blood persists for some time after cessation of the drug. Large doses have a hemolytic action.

127. **Corrosive Sublimate Treatment of Angiomata.**—Bindi relates three cases of disfiguring angiomata cured by Fiorani's technic of local applications of collodion containing 13 per cent. of corrosive sublimate. When the eschar dropped off the parts beneath were found covered with normal epidermis, the angiomata having been completely destroyed by the caustic applications.

128. **Malarial Gastrointestinal Hemorrhage.**—Scozzari describes the case of a civil engineer whose business took him temporarily into very malarial regions. He suffered from attacks of malarial fever, with hemorrhages from the stomach and intestines. The spleen and liver were not enlarged to any extent, and all the symptoms subsided under quinin. He ascribes the hemorrhages to a neuroparalysis of the walls of the vessels due to the action of the malarial poison. He does not think that any actual lesions were the source of the bleeding.

Medicinskoe Obozryenie, Moscow.

Last indexed page 432.

130 (LXI, No. 4.) Hepatopexia. V. N. Rozanoff.
131 *K kazuistikye ostrago gonorroinago parenchymatoznago prostatita (gonorrheal prostatitis). A. P. Jordan.
132 Experimental Data on Large Dogs for Study of Origin of Arrhythmia of the Heart.—O proiskhozdenii aritmii. D. Pletneff.
133 (No. 5.) *Asymmetrical Radial Pulse with Mitral Stenosis.—O razlitchnom puls v lutchevykh arteriyakh pri stenozye lyevago venoznago otverstiya. N. E. Kusheff.
134 *Chorionepithelioma motchevogo puzyra (of bladder). Devitzki.
135 Anti-alcohol Measures. Z. A. Blum.
136 (No. 6.) *Importance of Syphilis in Etiology of Tabes. Case of Tabes in Child.—O znatchenii syphilisa v etiologii spinnoi sukhotki. P. A. Preobrazhensky.
137 Case of Geophagia.—Slutchai nepreodolimago vletcheniya k zemleyedstvu.
138 2 Cases of Primary Angiosarcomata of Kidney.—2 slutchai perv. opukholi potchek. I. Pozhariski.
139 (No. 7.) Two Operations for Wounds of the Heart.—K kazuistikye ranenii serdtza. P. Gertzen.
140 3 Cases of Bladder Complications in Appendicitis.—Oslozhnenia so storony motchevogo puzyrya pri appendicitye. G. Baradulin.

131. **Acute Gonorrheal Prostatitis.**—Jordan has observed this complication in about 3.7 per cent. of his 482 cases of gonorrhea. One of the 13 patients had four abscesses and another two. The pus emptied into the urethra from 13 of the abscesses; into the rectum from 2; and once it found an outlet through the perineum. To prevent evacuation of the pus through some dangerous byway he advises an early incision without waiting more than ten days for fluctuation. In local treatment he orders rectal injections of hot water or instillations. He gives sodium salicylate internally, and finds it very useful.

133. **Cause of Asymmetrical Pulse in Mitral Stenosis.**—The findings during life and after death indicated that the cause of the differences in the radial pulse was evidently a compression of the arch of the aorta and of the carotid and subclavian arteries from the enlarged left auricle.

134. **Chorioepithelioma of the Bladder.**—The microscope confirmed the diagnosis of malignant chorioepithelioma of the bladder in the case described. It was in the bladder of a woman of 75, a virgin, and was evidently primary. There were numerous myofibromata in the uterus, but no traces of chorioepithelioma in the genitalia.

136. **Syphilis in Origin of Tabes.**—Preobrazhenski asserts that everything tends to show that there can be no tabes without syphilis any more than there can be a diphtheritic paralysis without preceding diphtheria. He does not think that preceding antisyphilitic treatment has much, if any, influence in preventing the development of tabes. His own experience, as well as that of others, has shown that it may develop after and even simultaneously with persevering specific treatment the same as without any treatment. He describes a case of tabes in a child of 12 whose mother was under treatment for cerebral lues and tabes, the tabes developing nearly simultaneously in mother and son.

Hospitalstidende, Copenhagen.

Last indexed page 1234.

141 (XLVII, No. 46.) Research on Catgut Introduced into Anterior Chamber. Sterilizing by Boiling.—Undersogelser over Catgut, indbragt i forreste Ojekammer. C. F. Heerfordt.
142 (No. 47.) *Et Tilfaelde af medfodt total Farveblindhed med Bemerkninger om Stav- og Tapfunktion (congenital color blindness). J. Bjerrum.
143 (Nos. 47-49.) Rhinoplastik. J. Boysen.
144 *Undersogelsen af Thorax' Bevaegelser (movements of thorax). E. Bocher.
145 *Appendicitis pelvica. A. Borgbjaerg.
146 (No. 50.) *On Behandling af Myxedemet med meget smaa Thyreoidin doses. S. Alsted.
147 Origin of Sensation.—Om Folelsens anatomiske og fysiologiske Oprindelse. S. Thalbitzer.
148 (No. 51.) *Meddelse om organoterapeutiske Forsog ved Morbus Basedowii med Praeparater af Thyreoidektomerede Geder (organ treatment of exophthalmic goiter). S. Christens.
149 (No. 52.) *Behandling af tor traumatisk Arthroitis med Vaselin-Injektion. T. Rovsing.
150 (XLVIII, Nos. 1-2.) Bidrag til det kroniske Mavesaars Patogenese (gastric ulcer). C. E. Bloch.
151 Et Tilfaelde af Veronalforgiftning (veronal poisoning). J. Kuhn.
152 (Nos. 3-5.) Behandlingen af Appendicitis. L. Kraft.

142. **Case of Congenital Total Color Blindness.**—Bjerrum's patient was a fisherman, 21 years old, and the ophthalmic findings were typical of congenital total color blindness, similar to the findings in Grunert's 5 cases. The patient's two brothers seemed to have been affected in the same way. Bjerrum has made a careful study of the physiology of color vision deduced from its absence in this case, and thinks that our present views in regard to the functions of the rods and cones need considerable modification, which he describes in detail.

144. **Movements of the Thorax.**—Bocher gives an illustrated description of an apparatus devised to record the movements of the thorax. He calls it the "differential respirometer," and relates a number of instances of its use and of the important information derived therefrom. The difference between the excursions of each half of the thorax frequently reveal the existence of lesions within before any other signs are evident.

145. **Pelvic Appendicitis.**—This form of appendicitis is considered less serious than other forms by Borgbjaerg, as there is less danger of peritonitis. The appendix is liable to be held down in the pelvis afterward by adhesions, which reduces the liability to recurrences. He describes 4 cases in detail to show the clinical peculiarities of this form and the indications for treatment. There is not the necessity for prompt radical operation here as in the other forms. The lesion soon becomes walled off; this should be favored by immobilization under careful supervision. One of his cases terminated fatally, and this was the only patient operated on. Perforation occurred in a gangrenous loop which had been deemed sound at the operation five days before. In 2 of his cases, the large tumors palpated through the rectum subsided spontaneously under medical treatment. One of these patients had not even

submitted to immobilization. Borgbjaerg emphasizes the importance of examination by palpation through the rectum, and advises this route for the incision when an abscess renders it necessary. He does not think that it is advisable to remove the appendix. When an abscess is found low in the pelvis during a laparotomy it should be drained from below, not through the laparotomy wound. The easiest route is through the rectum. The diet should be regulated after an attack of appendicitis to prevent constipation, as this is liable to favor recurrence of trouble.

146. **Treatment of Myxedema with Very Small Doses of Thyroid Extract.**—Alsted reports a case of myxedema in a woman of 60. The illustrations confirm the entire recovery of the patient under thyroid treatment instituted on the principle of gradually increasing doses, commencing with doses so small as to have actually no action or next to none. For two months the daily dose was only .5 cg. and then 1 cg. was taken and continued every day. By the end of six months the patient was as well as before the onset of the myxedema, and has kept well during the year since, still continuing her daily dose of 1 cg. of the extract, representing only about one-thirtieth of a lamb's thyroid gland.

148. **Treatment of Exophthalmic Goiter with Blood of Thyroidectomized Goats.**—Christens has treated 18 patients and reports very encouraging results. The goats had been thyroidectomized, and he wanted to use their serum to inject into his patients as the theoretically preferable technic. But this mode has so many disadvantages that he tried giving the desiccated blood, powdered and mixed with gum arabic to form tablets, containing each about .35 gm. The treatment is symptomatic, requiring to be kept up continuously, the same as thyroid treatment in myxedema, but the great improvement observed justifies its use. The nervous tension relaxed, the patients were able to sleep better, digestion and nutrition were very much improved, the sweating and tremor ceased, and the patients increased in weight. In the mild cases it arrests the progress of the disease, and in the severer ones it protects the organism against further damage from the toxin. Treatment by the milk of thyroidectomized animals has several disadvantages, among them the fact that the milk secretion soon dries up in the animals after removal of the thyroid. He appends the clinical histories of a number of typical cases to show the constant improvement with 2 or 3 of the blood tablets daily. He urges a trial, at least, of organtherapy in every case of exophthalmic goiter, although, of course, it can have no influence on already established organic changes.

149. **Treatment of Joint Affections by Injection of Vaselin.**—THE JOURNAL chronicled two years ago Delagénière's success in treating a case of arthritis of the shoulder by local injection of vaselin. Rovsing now reports this treatment applied in 2 cases of "dry" arthritis. He used much larger quantities than Büdinger, who recorded last year 4 cases treated with 10 c.c. in one and 2 to 4 c.c. of the vaselin in the others. The results were much better in the patient treated with the larger amount. Rovsing's first patient was a woman of 33, with congenital dislocation of the left hip. It had been successfully corrected for years, but finally began to give trouble, becoming very painful. Various attempts were made to correct this, but the pains persisted at the slightest attempt to use the limb. He then injected 10 c.c. of warm vaselin directly into the capsule. There were severe pains and slight temperature at first, but these soon subsided, and the patient found that she had been freed from all pain in the joint. This lasted for four weeks, when the symptoms returned. He was convinced that the amount injected had been too small to lubricate the whole of the capsule. Consequently he opened the joint under chloroform, and injected 25 c.c. of vaselin into the capsule, through an incision over the trochanter. There were severe pains at first but no temperature, and when the transient reaction had subsided, all pains in the joint had been permanently banished. There has been no recurrence to date, more than a year and a half after the intervention. The other patient was a gardener of 28, with ankylosis of the right hip from a tuberculous coxitis at puberty. He was able to walk with a cane until about a year before, when there were pains and cracking sounds in the other hip joint. They increased until he was unable to use the limb. Rovsing believed that the trouble was merely inflammation without effusion, due to the extra demands made on this hip. Under ether, 20 gm. of vaselin were injected through a puncture hole. There was no reaction, and in four days the patient was walking and using his limb freely without pain or cracking in the joint, and there has been no return of the pains during the ten months that have since elapsed. Rovsing has since treated a third case with equal success. He remarks that there need be no fear of embolism if the needle is inserted until its tip can be moved freely around in the cavity of the capsule. He thinks that these injections will be found a very valuable aid in the treatment of arthritis without effusion, of almost any origin. His first patient was operated on in April, 1902, more than a year before Delagénière's first publication on the subject.

Books Received

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

THE DRUG TRADE IN FOREIGN COUNTRIES. Vol. xiv. Reports from the Consuls of the United States on the Laws and Regulations Governing: 1. The Drug Business. 2. Druggists v. Pharmacists. 3. Exports of Drugs and Chemicals. 4. Imports of Drugs and Medicines. 5. Sale of Drugs and Medicines in Lay Stores. 6. Disposal of Prescriptions. 7. Renewal of Prescriptions. 8. Practice of Pharmacy. Issued from the Bureau of Foreign Commerce, Department of State. Paper. Pp. 417. Washington: Government Printing Office. 1898.

COLONIAL ADMINISTRATION, 1800-1900. Methods of Government and Development Adopted by the Principal Colonizing Nations in Their Control of Tropical and Other Colonies and Dependencies, with Statistical Statements of the Area, Population, Commerce, Revenue, etc., of Each of the World's Colonies. Including Bibliography of Colonies and Colonization Prepared by the Library of Congress. O. P. Austin, Chief of Bureau. Paper. Washington: Government Printing Office. 1903.

DISEASES OF THE BLOOD (Anemia, Chlorosis, Leukemia, Pseudoleukemia). By Dr. P. Ehrlich, of Frankfort-on-the-Main; Dr. A. Lazarus, of Charlottenburg; Dr. K. von Noorden, of Frankfort-on-the-Main, and Dr. Felix Pinkus, of Berlin. Entire Volume Edited, with Additions, by Alfred Stengel, M.D., Professor of Clinical Medicine, University of Pennsylvania. Fully Illustrated. Cloth. Pp. 714. Price, $5.00 net. Philadelphia: W. B. Saunders & Co. 1905.

A TEXT-BOOK OF MEDICAL CHEMISTRY AND TOXICOLOGY. By James W. Holland, M.D., Professor of Medical Chemistry and Toxicology, and Dean, Jefferson Medical College, Philadelphia. Fully Illustrated, Including 8 Plates in Colors. Cloth. Pp. 600. Price, $3.00 net. Philadelphia: W. B. Saunders & Co. 1905.

PROCEEDINGS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION AT THE FIFTY-SECOND ANNUAL MEETING held at Kansas City, Mo., September, 1904. Also the Roll of Members. Cloth. Pp. 1,034. Baltimore: Published by the American Pharmaceutical Association. 1904.

THE PREPARATION AND AFTER-TREATMENT OF SECTION CASES. By W. J. Stewart McKay, M.B., M.Ch., B.Sc., Senior Surgeon of the Lewisham Hospital for Women and Children, Sydney. Cloth. Pp. 651. Price, 15 shillings net. London: Bailliere, Tindall & Cox. 1905.

DIE DIREKTE BESICHTIGUNG DER SPEISEROHRE OSOPHAGOSKOPIE. Ein Lehrbuch für den Praktiker. Von Prof. Dr. Hugo Starck, Heidelberg. Mit Drei Farbigen Tafeln und Zwanzig Abbildungen. Paper. Pp. 219. Wurzburg: A. Stuber's Verlag (C. Kabitzsch). 1905.

INFANTILE MORTALITY AND INFANTS' MILK DEPOT. By G. F. McCleary, M.D., D.P.H., Medical Officer of Health of the Metropolitan Borough of Battersea. Cloth. Pp. 135. Price, 6 shillings net. London: P. S. King & Son. 1905.

A HAND-BOOK OF NURSING. Revised Edition. For Hospital and General Use. Published under the Direction of the Connecticut Training-school for Nurses. Cloth. Pp. 319. Price, $1.25. Philadelphia: J. B. Lippincott Co. 1905.

THE OPEN-AIR TREATMENT OF PULMONARY TUBERCULOSIS. By F. W. Burton-Fanning, M.D. Cantab., Physician to the Norfolk and Norwich Hospital. Cloth. Pp. 176. Price, $1.50 net. Chicago: W. T. Keener & Co. 1905.

DISEASES OF THE HEART AND AORTA. By Thomas E. Satterthwaite, M.D., Professor of Medicine in the New York Postgraduate Medical School. Cloth. Pp. 304. Price, $3.00 net. New York: E. R. Pelton.

NINETEENTH ANNUAL REPORT OF THE STATE BOARD OF HEALTH and Vital Statistics of the Commonwealth of Pennsylvania. Vols. I and II. Cloth. Pp. 1,102. Wm. Stanley Ray, State Printer of Pa. 1904.

A REFERENCE HANDBOOK FOR NURSES. By Amanda K. Beck, of Chicago. Bound in Flexible Morocco. Pp. 150. Price, $1.25 net. Philadelphia: W. B. Saunders & Co. 1905.

REPORT OF THE TRUSTEES OF BELLEVUE AND ALLIED HOSPITALS for Three Months ending June 30, 1904. Paper. Pp. 13. New York: M. B. Brown Co. 1904.

FOURTEENTH ANNUAL REPORT OF THE OHIO HOSPITAL FOR EPILEPTICS, at Gallipolis, for the Year 1904. Paper. Pp. 59. Columbus: F. J. Heer. 1905.

TWENTY-SEVENTH ANNUAL REPORT OF THE BOARD OF HEALTH OF THE STATE OF GEORGIA for the Year 1904. Paper. Pp. 65.